

Archaeological Sites Inventory in the Black Hills of the Pinon Canyon Maneuver Site, Las Animas County, Colorado

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Popular Abstract

Across the western United States there are numerous landforms known as Black Hills, Black Buttes, or Black Foothills. These are tree-covered areas located adjacent to open plains or steppes, so named because to people travelling across the flat areas, the tree-covered rises appear dark or black on the horizon. This setting of open steppes and juxtaposed hills is found along the eastern portion of the Pinon Canyon Maneuver Site (PCMS), a U. S. Army training facility in southeastern Colorado. Archaeologists searching in the PCMS Black Hills found 325 sites of former hunting and gathering cultures. These sites contained artifacts ranging in age from 8000 to 9000 year-old Paleo-Indian remains to those left by 300 to 400-year-old Protohistoric Plains Indian tribes. Archaeologists discovered a pattern to the sites in the Black Hills. Sites with projectile points and hide scrapers reflecting hunting activities were found on the west end of the Black Hills, where they overlooked the grass-covered steppes. Sites with manos and metates, evidence for plant processing, were found along the northern side where they offered access to the abundant stands of Indian rice grass and other edible plant communities. Sites with numerous chipped-stone flakes, in early stages of production, were located on the east end, where there is access to cherts and quartzites in natural outcrops. The numerous sites and long period of use in the Black Hills attest to the popularity of the juniper and pine covered area for hunting and gathering cultures.

Technical Abstract

The Black Hills are an upland region along the east borders of the Pinon Canyon Maneuver Site (PCMS), a U. S. Army training facility in southeastern Colorado. In a cultural resource survey project, archaeologists found 325 previously unrecorded sites in the Black Hills. Dominated by lithic scatters (88%), the Black Hills sites range from Paleo-Indian artifacts (Hell Gap) to historic Euroamerican homestead remains. The majority of the sites, however, contain prehistoric artifacts as the only cultural evidence. The Black Hills appear to have been especially popular during the early and middle Ceramic stage between AD 200 and AD 1500, when the PCMS residents utilized houses with stone walls.

A new process for evaluating and recording surface chipped-stone debitage was used in the Black Hills research. Devised by Stanley Ahler, the analysis allowed us to make some observations about former activities at different locations. The western end, near the open steppe terrain that dominates the PCMS, contains evidence for a mixed hunting and gathering economy with emphasis on hunting, while the southern perimeter of the Black Hills has large numbers of grinding tools -- evidence for plant collection and processing. Apparently, the extensive use of the steppes by ungulates accounts for the nearby hunting sites, while the proximity to edible grasses such as Indian rice grass, explains the large numbers of ground-stone tools on the southern perimeter. The area near Purgatoire Canyon reflects quartzite procurement activities. We concluded that the chipped-stone debitage analysis procedure described in the report was successful in that it allowed us to make observations about surface sites that were not possible in previous research.

Acknowledgments

Major field efforts are required, by necessity, to complete large-scale cultural resource survey projects. The Black Hills project, in a remote region of southeastern Colorado, was exceptionally challenging. Chris Loendorf and Vince Schiavitti supervised field crews that worked long, hard and often very hot days. On the days when the gnats are so thick you can't see the sun, or the evenings when the showers are so cold that you wonder if you'll ever be warm again, you begin to ponder the notion that archaeology might not be such a great profession. But on the days when you find a Paleo-Indian point, discover the rock walls of an ancient house or find an undiscovered petroglyph, you remember why you enjoy being an archaeologist. We had some great young archaeologists on this project, and we acknowledge their hard work – Jane Arie, Bonnie Bagley, Sylvia Feliner-Marinas, Hadley Harper, Cory Harris, Alan Madsen, Aaron Manion, Mark Owens, and Ann Phillips.

At the completion of a long field season, everyone wants to relax and enjoy civilization again. Unfortunately, the site forms need to be cleaned up and turned in, and with the many sites in the Black Hills, the completion of site forms is a big project. We are thankful for the effort of Vince Schiavitti, Victoria Quiroz, Teresa Henehen-Browning, Judie McNew and Bonnie Newman in completing the site forms.

Feeding a large field crew is no easy task at any time, and it is especially difficult when it is 60 miles to the grocery store, you are working on a stove that loses electrical power every other day, and one refrigerator freezes all the vegetables. We offer our greatest "thank you" for the work of Sherrie Landis, chief cook, nursemaid, and mom to the crew. John Gallegos also deserves credit for his help around the camp.

Renee Beltran is a very capable young woman who keeps the paychecks flowing and the creditors happy. We would be lost without her and offer our heartfelt thanks for her diligent work.

We thank Tom Warren, Mary Barber, Steve Chomko and Randy Korgel of the Directorate of Environmental Compliance and Management, United States, Army, Fort Carson for supporting the research. The administrative assistance from the Midwest Archeological Center's Melissa Connor, Ralph Hartley, and Steve Devore is appreciated. The editing help from the Midwest Center was very useful.

In the end, we are responsible for the information in the report, its shortcomings and strong points. We all enjoyed the Black Hills Survey and hope you will learn from this report.

Preface

The archeological survey and evaluations reported in this manuscript are an important part of the Fort Carson Cultural Resources Management Program whose goal is to maintain the largest possible area for military training while protecting significant cultural and environmental resources. The current study is part of an integrated program that takes a long-term systematic approach to meeting identification, evaluation, and resource protection requirements mandated by the National Historic Preservation Act. While meeting legislated requirements, this project also provides a valuable contribution to our knowledge of the prehistory and resources of Las Animas County, Colorado. Under a cooperative agreement, New Mexico State University, operating through the National Park Service, Midwest Archeological Center, provides assistance in meeting Fort Carson's cultural resources goals.

Fort Carson began cultural resources studies immediately following the purchase of the lands that became the Pinon Canyon Maneuver Site in 1983. The Cultural Resources Program takes a multidisciplinary approach, combining archeological theory and historical methods with geological, geomorphological, botanical, and statistical techniques and procedures in order to focus its efforts to locate, evaluate, and protect significant cultural properties. Professional studies and consultations with Native American tribes have resulted in the identification of National Register eligible sites and districts. The cultural resources of Fort Carson and the Pinon Canyon Maneuver Site represent all major prehistoric and historic cultural periods recognized in the Great Plains and Rocky Mountains. Sites of the Paleo-Indian, Archaic, Ceramic, and Protohistoric periods are present, as are sites from the Fur Trade era, 19th century Hispanic and Euroamerican settlement, early 20th century homesteading and ranching, and World War II and Cold War era military sites.

The Cultural Resources Management Program is in the Directorate of Environmental Compliance and Management (DECAM). The directorate is tasked with maintaining Fort Carson's compliance with federal, state, and local environmental laws and mandates. The DECAM holistic management philosophy maintains that all resources are interrelated. Because decisions affecting one resource will impact other resources, the decisions we make today will affect the condition of Department of Army lands and resources for future training, research, and recreation. Mission requirements, training resources, wildlife, range, soil, hydrology, air, and recreation influence cultural resources management decisions. Integrating compliance and resource protection concerns into a comprehensive planning process reduces the time and effort expended on the compliance process, minimizes conflicts between resource protection and use, allows flexibility in project design, minimizes costs, and maximizes resource protection.

Federal laws protect the resources on the Pinon Canyon Maneuver Site and Fort Carson. Theft and vandalism are federal crimes. Protective measures ensure that Army activity does not inadvertently impact significant cultural and paleontological sites. Fort Carson does not give out site location information, nor are sites developed for public visitation. Similar resources are located in the Picketwire Canyonlands where public visits can be arranged through the U.S. Forest Service, Comanche National Grasslands in La Junta, Colorado.

Fort Carson endeavors to make results of the resource investigations available to the public and scientific communities. Technical reports on cultural resources are on file at the Fort Carson Curation Facility (Building 2420) and the Colorado State Historic Preservation Office and are available through the National Technical Information Service, Springfield, VA. Non-technical reports on the prehistory, history and rock art of southeastern Colorado have been distributed to schools and public libraries in Colorado. Three video programs produced by Fort Carson are periodically shown on Public Broadcasting Stations. Fort Carson continues to demonstrate that military training and resource protection are mutually compatible goals.

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Directorate of Environmental Compliance and Management
Fort Carson, Colorado
June 2000

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Chapter I: Introduction

From April to October 1997 a large-scale archaeological site inventory and reconnaissance was conducted by New Mexico State University (NMSU) in the Black Hills of the Piñon Canyon Maneuver Site (PCMS). The fieldwork was conducted under a cooperative agreement between the National Park Service (NPS) Midwest Archeological Center and New Mexico State University. The U.S. Army funded the project.

The PCMS is federal property that has been under the management of the Department of the Army, Fort Carson command since 1983. The site is used primarily as a training area for mechanized tracked and wheeled vehicles with helicopter and high-performance aircraft support. During some types of maneuvers, approximately 6,000 troops, along with tanks, heavy trucks, and helicopters, can descend upon the area for military exercises and, if proper precautions are not taken, impact cultural resources adversely.

The goal of the fieldwork was to identify any prehistoric or historic archaeological sites located within the project area. Once sites are located, the basic information is recorded, with the objective of determining their eligibility for the National Register of Historic Places (NRHP) and to provide the appropriate recommendations to ensure their protection.

The NRHP criteria for eligibility to the National Register are originally listed in *The Code of Federal Regulations, Title 36, Part 60*. These criteria were reproduced and listed in a *National Register Bulletin* (1991) that discussed the justifications and application procedures for properties that may be eligible for National Register status. According to this document, historic places are determined to be significant or not, based on the following criteria: "The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history."

These criteria provide useful, broad outlines for the evaluation of historic places, but they lack specificity—especially with regard to prehistoric sites. In other words, how does one actually determine if an archaeological site may yield important information on the prehistory of an area? In order to aid in this determination, four "research domains" have been established for prehistoric remains in the PCMS (Andrefsky 1990a; Andrefsky et al. 1990) that provide important or significant lines of inquiry. These domains include chronology, paleoenvironments, settlement-subsistence systems, and exchange and mobility. Essentially, if it can be

demonstrated that prehistoric sites or locales have the potential to yield data bearing on these research domains, they should be considered as significant and therefore eligible for the National Register of Historic Places.

Chronology is important in that it establishes the framework allowing the description of patterns of change and stability through time. Without chronology archaeologists are limited to rather sterile synchronic descriptions. Chronologies should be constructed through a combination of numerical age estimating and relative dating techniques (Andrefsky et al. 1990:1068-1087). The analysis of diagnostic artifacts such as projectile points and certain ceramic types combined with the use of radiocarbon, archaeomagnetic, obsidian hydration, and cation-ratio varnish dating is required to aid in the construction of chronologies. The presence of thermal features at a site may be an indicator of the presence of subsurface deposits and that carbon may be found useful for dating the approximate time that the feature was used. Sites with these classes of data should be considered for National Register eligibility.

The second research domain is paleoenvironments. The prehistory of the PCMS is dominated by hunter-gatherers who tended to be rather sensitive to changes in the environment. Much of the change in the artifact assemblages of hunter-gatherers can be explained as the result of adaptive responses to climatic conditions. The lack of sites dating to the Paleo-Indian and Early Archaic periods has been attributed to post-Altithermal erosional processes (Schuldenrein et al. 1985); however, some scholars (McFaul and Reider 1990) have recently suggested that there are some isolated sediments dating to the late Pleistocene and early Holocene. Schuldenrein et al. (1985) suggest that the southeastern Colorado climate was warm and dry after A.D. 1000, with no significant mesic changes. They also conclude that between approximately 350 B.C. and A.D. 1000 the climate was drier and wetter than the period after A.D. 1000. Loendorf et al. (1996:279-280) indicate that the climate was somewhat wetter, but vegetation remained stable. Chomko (1997) suggests that the environment of the entire span of the Ceramic stage remained relatively stable. Scott (1984) and Scott Cummings (in Schiavitti et al. 1999) indicate a fairly complex set of climatic fluctuations through time. Based on observations from 5LA5255 (Sue Site) Scott Cummings concludes that warm and wet conditions prevailed with some fluctuations between approximately 500 B.C. and A.D. 970. Periods characterized by less effective moisture began at approximately A.D. 970. By A.D. 1200, conditions ameliorated somewhat, with a return to more mesic conditions. These interpretive discrepancies indicate the need to refine our understanding of the nature of environmental changes through time at the PCMS and in southeastern Colorado in general. The analysis of floral and faunal materials from site and non-site localities can provide valuable information on paleoenvironments and how they may be related to adaptive responses of the human populations living in the area. These materials can generally be found in or around thermal features, on living surfaces, or even in areas such as arroyo cuts.

One way human populations adapt to changing circumstances is by altering their land use patterns and movements across the physical environment. These changes are often reflected in the settlement-subsistence system, which is the third research domain. Essentially, this domain deals with the analysis of spatial and locational information on the distribution of different site types across the landscape and how these patterns may be related to subsistence activities. Two

important research questions have been postulated for the PCMS that fit within this domain. The first deals with the degree of continuity in settlement and economic strategies between the Archaic and Ceramic stage occupations of the PCMS. The second tries to determine if increasing sedentism and population aggregation during the Ceramic stage was caused by a deteriorating climate. Along with subsistence information derived from floral and faunal analyses, locational and site structure information is needed to address these questions.

The fourth domain is that of exchange and mobility. No society or culture group lives in total isolation. Interactions of different kinds are a common occurrence among neighboring cultural groups. Exchanges of goods such as raw material for stone-tool manufacture is one such type of interaction. Exchange and interaction can lead to the adoption of new technologies or other sociological influences. PCMS populations, as a result of their interactions with the American Southwest, may have adopted the bow and arrow, ceramics, cultigens, and semipermanent dwellings (Andrefsky 1990:VIII-22). The degree of stylistic similarities of artifacts (especially ceramics) between neighboring groups is often used as an indicator of interaction. Lithic raw materials are another line of evidence that can be used to suggest exchange between neighboring groups. Obsidian, Alibates chert, some types of chalcedony, some silicified wood, and some cherts are not locally available to the populations of the PCMS (Andrefsky 1994:25). The presence of these raw materials at PCMS sites indicates that they may have arrived via trade and exchange with other external groups.

The fieldwork for this project was completed in two sessions. The survey project started on April 28, 1997, with crews moving trucks and equipment from Las Cruces, New Mexico, to the PCMS. The first day was spent cleaning the Red Rocks facility, but by late afternoon crews were sent out to visit the survey area. Full-scale survey started on April 30 and continued in 10-day intervals until July 15, 1997. After an interim break while the Army was on maneuvers, crews returned to the PCMS on August 29, 1997, and completed fieldwork in 10-day intervals on October 4, 1997. Crew size varied during this 100 days of fieldwork, but the following individuals were involved in the project: Larry Loendorf, principal investigator, Vincent Schiavitti and Christopher Loendorf, who were crew chiefs, and crew members Mark Owens, Cory Harris, Alan Madsen, Bonnie Newman, Aaron Manion, Sylvia Feliner-Marinis, Bonnie Bagley, Jane Arie, Teresa Henahan-Browning, Ann Phillips, and Judie McNew. The camp cook was Sherry Landis, and John Gallegos assisted with grocery shopping and camp maintenance. Photographic documentation of significant sites was completed by Hadley Harper, who also filled in as a survey crew member during times when there were no significant sites to photograph. Midwest Archeological Center personnel included project coordinator Melissa Connor and crew members Dan Crouch and Karen Roberts. Randy Korgel and Steve Chomko of the Directorate of Environmental Compliance and Management for the Army at Fort Carson were in the field at various times as they evaluated significant sites and helped complete fieldwork. Randy Korgel, assisted by various individuals, fenced the significant sites that were found in the first portion of the survey. Fencing was designed to preempt damage to the sites from the July 1997 Army maneuvers.

This report documents the procedures and results of this fieldwork. Materials derived from this work, including notes, forms, photographic prints and negatives, scaled drawings, and artifacts, are currently curated at the Museum of Anthropology at New Mexico State University. Eventually, this material will be housed with other archaeological remains at the Fort Carson, Colorado Curation Facility.

Three hundred and thirty sites (unrecorded and previously recorded) are discussed in this report. Results from the fieldwork indicate that 44 sites are recommended as eligible for listing to the National Register, while a total of 286 sites are considered not eligible for the National Register and require no further work. Justification for these determinations are given in the section pertaining to the eligibility recommendation for each of the sites investigated, and in Appendix I each of the site descriptions are given.

Physical Environment of the PCMS

The PCMS is a restricted military reservation that covers an area of approximately 380 square miles of semiarid lands in Las Animas County of southeastern Colorado. The PCMS belongs to the High Plains region of Colorado, which itself is part of the extensive Interior Plain of North America. The plains, low hills, and canyons of the PCMS range in elevation from between 1,341 to 1,768 m (4,400 to 5,800 ft) above sea level (asl).

The Purgatoire River, a tributary of the Arkansas River, forms the eastern boundary of the PCMS. Much of the PCMS is composed of relatively flat to low rolling plains that are deeply dissected by several west-to-east canyons and arroyos that drain into the Purgatoire River. There are four major topographic units (Figure 1.1) in the PCMS (Schuldenrein et al. 1985). These include the steppe, the 'hogback,' the canyons, and the hills. McFaul and Reider (1990:1-11) also note the existence of several alluvial and colluvial terraces along the Purgatoire River and its tributaries, along with some dune deposits mantling segments of the steppes.

The grassland steppes are the single largest topographic unit in the PCMS. The steppe areas are composed of somewhat level or gently sloping terrain with sparse grassland vegetation. Trees are somewhat rare but do exist near larger watercourses and rocky outcrops with springs.

The 'hogback' is a steep ridge of shales and limestones that extends for approximately 15 km. The hogback is located along the southern boundary of the PCMS and is bounded by Van Bremer Arroyo to the north. Its main feature is an exposed basalt dike along its crest. Patches of piñon and juniper grow along the crest, with grasses and low shrubs dominating the rocky slopes. Rock art is commonly found on the basalt blocks that have eroded onto the steppes along the Van Bremer Arroyo as well as on top of the dike itself.

Arroyo and canyon landforms dissect the grassland steppes. The main canyon areas include Van Bremer Arroyo, Burke Arroyo, Taylor Arroyo, Lockwood Canyon, Red Rock Canyon, Welsh Canyon, Stage Canyon, Bent Canyon, Iron Canyon, and Minnie Canyon.

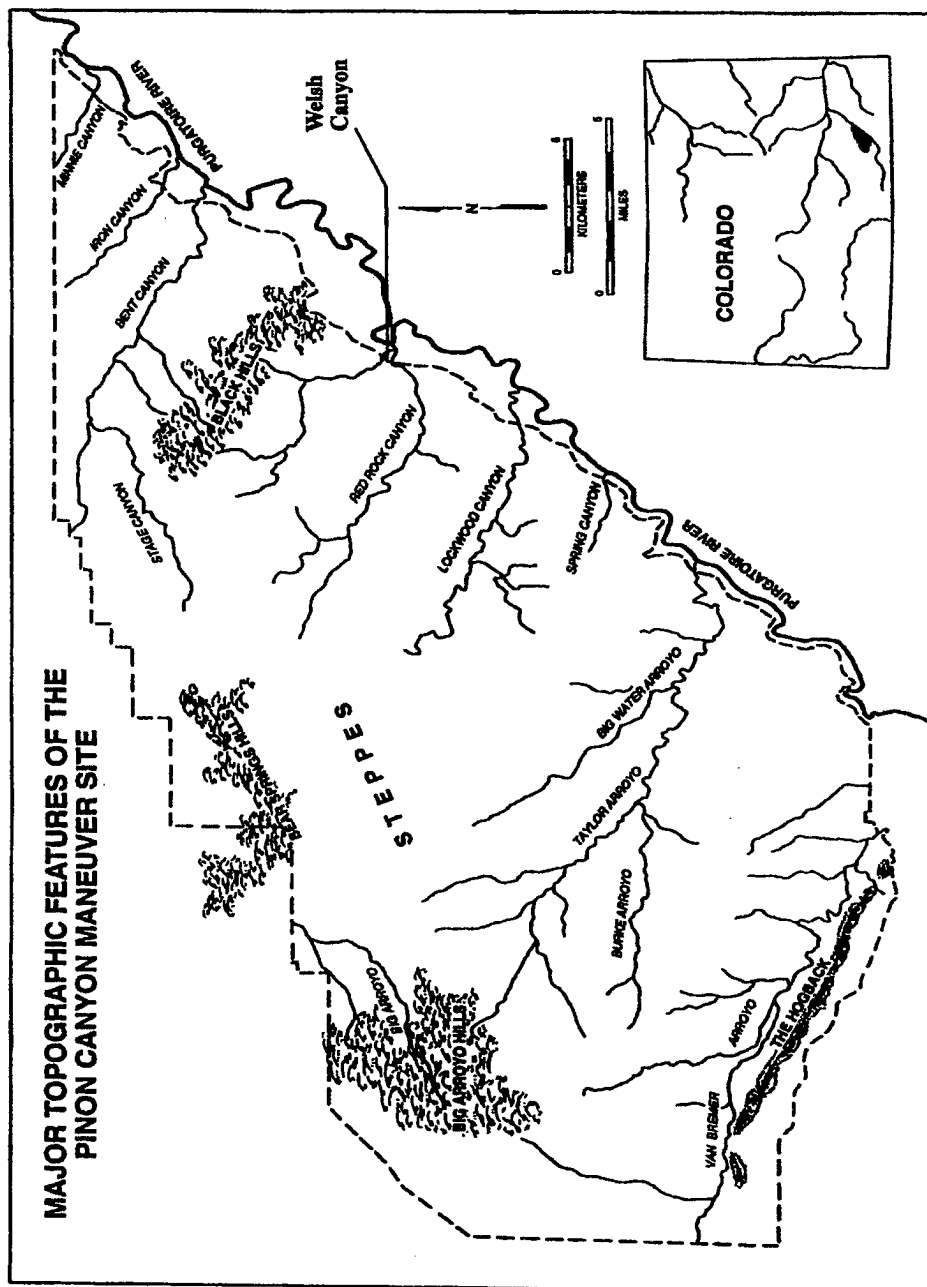


Figure 1.1: Major Topographic Features of the Pinon Canyon Maneuver Site.

The canyons extend in a southeasterly direction and drain into the Purgatoire River. The canyon valleys are up to 150 m deep and 700 m wide in the major drainages (Lockwood and Red Rock Canyons). The canyons are steep sided with exposed cliff faces and talus slopes littered with eroded boulders near the valley floor. Riparian vegetation, such as cottonwood trees, grasses, and shrubs, grows along the channels. Juniper trees, shrubs, small prickly pear cactus, and cholla are common along the canyon slopes.

The Big Arroyo Hills, Bear Spring Hills, and the Black Hills located in the northeast and west exhibit the most differentiated terrain and consist of upland mesas and steep slopes. Piñon-juniper savanna is the typical vegetative pattern.

Its location and proximity to the Rocky Mountain range to the west most directly influences the present climate in the PCMS. Most precipitation is released over the Rockies, leaving the southeastern Colorado plains semiarid. However, across the different areas of the PCMS, precipitation and temperature can vary greatly. The United States Department of Agriculture (1941:799) indicates that temperatures in Las Animas County ranged from -32 degrees Fahrenheit to 110 degrees Fahrenheit over a 21-year period. January temperatures average 32.7 degrees Fahrenheit, while the average temperature in July is 71.5 degrees Fahrenheit. Most precipitation falls during the spring and summer, and the annual amount of precipitation averages 14.02 inches. Temperature, rainfall, and other factors result in an average annual growing season of 142 days beginning in mid-May and ending in early October.

The paleoclimate for the PCMS is somewhat difficult to characterize. Antevs' (1955) general model of Holocene climatic change is good for a broad area; however, there were likely some localized areas where climatic variability differed from the general model. Scott (1984) and Scott Cummings (in Schiavitti et al. 1999) concludes that, for some areas of the PCMS, warm and wet conditions prevailed with some fluctuations between approximately 500 B.C. and A.D. 970. According to pollen evidence, the period between 450 B.C. and 520 B.C. exhibited somewhat wetter conditions than just after 520 B.C. Scott Cummings (in Schiavitti et al. 1999:283) notes that periods characterized by increased effective moisture "were not severe enough to alter the local vegetation communities significantly. It is likely that vegetation was more dense and bare ground less obvious during periods of increased effective moisture." Periods characterized by less effective moisture began at approximately A.D. 970, and by A.D. 1200, conditions ameliorated with a return to more mesic conditions.

The Project Area

The project area assigned to the NMSU survey crew included the area covering the top of the ridge/mesa that forms the Black Hills landform. The highest elevation in the Black Hills is at approximately 1,635 m (5,365 ft), which is over 300 m above the canyon floor of the Purgatoire River. The steep-sided cliffs of Bent Canyon, its tributaries to the north, and Welsh Canyon on the south, help to expose this landform. The western edge of the Black Hills gradually slopes up from an expansive area of flat plains or steppe. The Purgatoire River is located approximately 2 km off the southeastern-most part of the Black Hills.

The project area covers an area of approximately 5,463 acres. Crews completed survey in the proposed area ahead of schedule and undertook survey in an additional 200 acres in the southern edge of the Black Hills. There is a boundary fence that creates a buffer zone between the mechanized training area and the actual limits of the PCMS. The additional 200 acres surveyed by the NMSU crew are located outside of the mechanized training area, but within this buffer zone and on lands that belong to the U.S. Army. This additional survey coverage and the sites located within it are discussed in this report.

Cultural Overview of the PCMS

The classification system for the prehistoric period in the PCMS is outlined in Anderson (1985, 1990). The classification divides the prehistory of the area into four stages and nine periods (Table 1.1). This section offers a brief summary of the prehistory of the PCMS as it is currently known. For further details, the reader should consult: Butler 1986; Campbell 1969; Gunnerson 1989; Haury 1989; Lintz 1984; Lintz and Anderson 1989. For more information on the Historic and Protohistoric periods as they pertain to the PCMS, the reader should consult: Carrillo 1990; Haury 1989b; Hanson and Chirinos 1989; Freidman 1985; Stoffle et al. 1984.

One of the most interesting debates in American archaeology deals with whether human occupation of the New World predates ca. 12,500 B.P. Putative occupations predating 12,500 B.P. are referred to as pre-projectile occupations. To date, there are few accepted sites in North America that predate 12,500 B.P., and no remains from this stage have yet been recovered from southeastern Colorado or the PCMS.

The Paleo-Indian stage is the earliest occupation in eastern Colorado that is accepted by most North American archaeologists. Paleo-Indians were nomadic hunters and gatherers who arrived to the New World approximately 12,500 B.P. Most archaeologists believe that they entered the New World by walking across a land bridge connecting modern day Siberia with Alaska that was temporarily exposed by the lowering of the sea level at the end of the Wisconsin glaciation. Ice-free corridors opened up as the glaciers retreated, allowing Paleo-Indian populations to migrate further to the south. Anderson (1985) recognizes three periods of the Paleo-Indian stage in the PCMS: Clovis (10,500-9000 B.C.), Folsom (9000-8200 B.C.), and Plano (8200-5500 B.C.). Remnants of the Paleo-Indian stage are rare in the PCMS. As of 1992 only 28 of the 1,442 recorded sites on the PCMS contain Paleo-Indian remains (Andrefsky 1990b:XIV-2). However, there are several Paleo-Indian sites known in the areas surrounding the PCMS, including the type site for the Folsom period, which is located about 100 km to the south in New Mexico.

In general, Paleo-Indian remains are often associated with Pleistocene megafauna such as mammoth and an extinct ancestor of the bison. This association has led many archaeologists to suggest that Paleo-Indian subsistence was almost exclusively based on big game animals.

Table 1.1. Classificatory Scheme for the PCMS (Anderson 1985, 1990).

Stage/Period	Dates
Pre-Projectile	Pre 11000 B.C.
Paleo-Indian	11000-5500 B.C.
Clovis	10500-9000 B.C.
Folsom	9000-8200 B.C.
Plano	8200-5500 B.C.
Archaic	5500 B.C. – A.D. 200
Early	5500-3000 B.C.
Middle	3000-1000 B.C.
Late	1000 B.C. – A.D. 200
Ceramic	A.D. 200-1750
Early	A.D. 200-800/1000
Middle	A.D. 800/1000-1500
Late	A.D. 1500-1750

Recent studies have documented the presence of small game animals such as jackrabbits, marmots, and turtles at Paleo-Indian sites. McNeish (1964:535), based on his work in Mexico, suggests that the Paleo-Indians of his region probably killed one mammoth in a lifetime and never got over talking about it. This evidence suggests that Paleo-Indians probably had a broader subsistence base than was once recognized.

Archaeological sites in the PCMS start to become more common and better understood during the Archaic stage. The Archaic stage is divided into three periods: Early (5500-3000 B.C.), Middle (3000-1000 B.C.), and Late (1000 B.C. - A.D. 200). Archaic sites yield grinding stones, large stemmed and notched projectile points, and other bifacially and unifacially made chipped-stone tools, and flake tools. There are special function sites, such as game drive sites or butchering and processing areas, and short-term use campsites (Butler 1986:181).

In general, the Archaic stages of North America are characterized by an increase in regional variation. However, the basic pattern of Archaic life consisted of people living in relatively small groups and relying on hunting and foraging for subsistence. Since much of the Pleistocene fauna relied upon by Paleo-Indians became extinct, Archaic hunters and gatherers had to shift the main focus of their subsistence. High frequencies of grinding stones suggest that plants started to become more important in the diets of Archaic people. The oldest rock art dated thus far in the PCMS is found at Archaic sites. The earliest forms of rock art are usually composed of abstract designs, but animal forms are also known.

Most of the sites discussed in this report date to the Ceramic stage, which is divided into three periods: Early (A.D. 200-800/1000), Middle (A.D. 800/1000-1500), and Late (A.D. 1500-1750). It is important to note that other terms, such as Plains Village for the Middle Ceramic period and Protohistoric for the Late Ceramic period, are employed to divide the Ceramic stage. Butler (1986, 1988) comments on the strengths and weaknesses of these different classifications. For the most part, we stay with Anderson's classification and refer to the other systems only when cited in other works.

Important changes of the Ceramic stage include the utilization of domesticated plants. As the name of the stage suggests, ceramics were also an important addition to the technology of Early and Middle Ceramic period people. There is evidence to suggest that the bow and arrow was adopted. Mobility decreased and sedentism increased from the Early Ceramic (A.D. 200-800/1000) to the Middle Ceramic (A.D. 800/1000-1500), as attested to by the presence of stone slab structures. In the PCMS, these structures tend to be small (approximately 2-3 m in diameter), circular structures with upright slabs. More formal structures and elements such as enclosing walls and dividing walls also appear in rockshelters at this time.

New information about the Ceramic stage has been developed through excavations at sites in Welsh Canyon. Schiavitti et al. (1999:257-258) conclude, based on pollen evidence, that Welsh Canyon experienced wet and dry cycles during the Ceramic stage. Even though these climatic conditions were not severe, some were associated with what appears to be a population increase throughout Welsh Canyon (or at least more foot traffic through the canyon). Adaptive responsive to these changes seems to have taken the form of a diversification of subsistence practices and an increase in trade and exchange with groups or individuals outside of southeastern Colorado.

Euroamerican contacts and the introduction of the horse at around A.D. 1700 characterize the Late Ceramic. Between A.D. 1500 and 1700, the area of the PCMS may have been in the control of the Plains Apache. The Comanche were also in the area between A.D. 1700 and 1750. After A.D. 1750, the Kiowa were linked with the Comanche and often made expeditions into the PCMS area. Late arrivals into the area include the Ute, Cheyenne, and Arapaho (Hanson and Chirinos 1989:18-38).

Euroamerican settlements to the south of the area made for significant changes after A.D. 1600. The active trade between the Plains Apache and the Pueblo Indians in this period was an important part of this change. The Pueblo traders exchanged corn, pottery, and blankets for Apache deerskins and buffalo hides, meat, and tallow (Carrillo 1990:XVIII-7). The Spaniards, New Mexicans, and Comanche entered into this trading pattern in what is referred to as the *Comanchero* period.

Ultimately, the New Mexicans and Spaniards started their own buffalo hunting for trade; these groups, known as the *ciboleros*, were not well liked by the Comanche, who complained about them until the buffalo were exterminated. By A.D. 1821, when Mexico obtained its independence from Spain, sheep raising became an important industry in the region. It became

an even more popular means of livelihood by the end of the Mexican-American War (A.D. 1848).

By A.D. 1859 there was a permanent sheep ranching operation on the upper Purgatoire River that was operated by two Hispanic brothers, Gabriel and Juan Gutierrez (Carrillo 1990:XVIII-27; Friedman 1985:63-64). The discovery of gold in the mountains near Denver stimulated economic growth and the demand for supplies. Travel routes brought more settlers to the region, and by the late 1860s, Charles Goodknight established a route to drive cattle from Texas through the west end of the PCMS. Permanent settlement by Euroamericans quickly followed (Friedman 1985; Haury 1989).

Chapter II: Methods and Techniques

The 1997 cultural resource survey in the Black Hills followed the established survey and analysis procedures as closely as possible (Dean 1992). This was done to ensure that the collection of data is compatible with previous archaeological research in the PCMS.

The intent of the survey was to locate and record all historic and prehistoric cultural remains within the project boundaries in a manner consistent with previous archaeological investigations in the PCMS. The survey units were examined on foot at a uniform 20-m transect spacing and all identified cultural materials, including both historic and prehistoric artifacts, were recorded as either isolated finds, prehistoric sites, historic sites, or as prehistoric/historic sites.

When possible, straight-line survey transects were aligned on cardinal compass bearings (i.e., east/west or north/south) and in all instances spaced at 20-m intervals. Dean (1992:IV-3) establishes the use of this method for quadrat archaeological survey in the PCMS. The use of straight-line survey transects was not always feasible, given the terrain in some portions of the PCMS, and this necessitated the use of a flexible strategy in order to maximize both efficiency and survey coverage. Steep slopes and vertical cliffs, which limit access in some areas, were prevalent in the project area. Such physiographic features prevented or complicated the use of straight-line survey transects.

For example, many of the closely spaced small drainages common to the PCMS have vertical cliffs along their margins. These drainages often meander. Attempting to walk a straight north/south or east/west transect even for a short distance results in crossing a number of vertical cliffs, as well as repeatedly walking up and down steep slopes. For this reason, it is considerably more efficient to use compass bearings that follow the general lay of the terrain and to allow transects to meander with drainages. In addition to being considerably less strenuous, this technique increases the probability that cultural material will be identified, because sites such as rockshelters are usually located at cliff bases on the drainage margins. If a straight transect is walked, the cliffs are only intersected at points where the drainage meanders across the transect, whereas following the drainage allows inspection of the entire cliff base. These modifications from the established procedures are not relevant from a sampling standpoint as long as uniform 20-m transect spacing is maintained.

Locating and Recording Sites and Isolated Finds

Site Identification

The 1997 Black Hills Archaeological Sites Inventory was conducted primarily with the use of two survey crews of four crew members. A crew chief, whose responsibilities included organizing survey transects for the most comprehensive and complete coverage possible and the supervision of the site recording process, led each crew.

With the exception of certain items, all cultural resources identified within the survey area were recorded as either an isolated find or a site. The distinction between a site and isolated find is based on the density of cultural materials in a locality, the potential for buried cultural deposits, and/or the presence of cultural features. According to Dean (1992:IV-11), evidence of human activities, not recorded as sites or isolated finds, include: contemporary transportation routes; trash associated with these routes (i.e., litter along modern roads); historic fence lines; pipelines; isolated metal windmills and stock tanks not associated with buildings or homestead locations; and recent recreation camps or facilities.

When a prehistoric or historic artifact was identified during survey, a pin flag was placed next to it, and the survey crew intensively examined the surrounding area for additional cultural material. Pin flags are normally placed next to artifacts working outward in all directions from the original identified cultural material. Double pin flags were placed at any features, obvious stone tools, ground stone, or unusual artifacts. Site boundaries were usually based on the extent of the artifact scatters, but natural boundaries such as drainages or cliffs were also used to delimit sites. In cases where natural geographical divisions did not occur, large areas with less than 20-m spacing between artifacts were not arbitrarily divided into separate sites. The extent of all sites was determined even if the site extended outside of the survey area.

Pin flagging continued for approximately 30 minutes or until the extent of the cultural material was identified (indicated by 20-m gaps that lacked artifacts); artifact counts were estimated for large sites. For expansive or particularly dense sites, rather than flagging all the artifacts within a small area of the site, flags were placed next to some artifacts throughout the site area. Pin flags were also used to indicate clusters of artifacts at high density and/or large sites.

In conformity with Dean (1992:IV-11-12), a location was considered an isolated find if fewer than four macroscopically unmodified flakes or a single tool occurred with a maximum distance of 20 m between artifacts. Localities are considered to be prehistoric sites when five or more macroscopically unmodified flakes or one or more tools with one or more flakes were identified within less than 20 m of one another. If indications of subsurface deposits were noted (e.g., heat-altered stone eroding from a cutbank), the areas were recorded as sites regardless of surface artifact density. Locations with architectural or non-architectural features were also recorded as sites regardless of surface artifact density.

Historic sites or isolated finds were defined on the same artifact density criteria as the prehistoric localities. Although the artifact density criteria are identical to those for prehistoric sites, exceptions were made for architectural features or artifacts that were separated by more than 20 m from the main site area, but obviously associated (Dean 1992:IV-12). For example, a corral and a nearby structure separated by 35 m are considered part of the same site even if there are no artifacts connecting the two localities. If both historic and prehistoric artifacts were found in the same location, the combined total of both prehistoric and historic artifacts was used to define site or isolated find status.

Site-Recording Procedures

In order to minimize access logistics, sites were recorded as they were identified during the survey. Site-recording procedures consisted of four principle tasks: completing the sketch map, chipped-stone and/or stone-tool analysis, the State of Colorado Management Data form, and the State of Colorado Prehistoric Component, Historic Component, Historic Architecture, and/or Rock Art Panel Supplement forms. The forms generated during the survey represent the most important part of the collected data. Forms, sketch maps, and site photographs were submitted to the Army for review before being sent to the Colorado Historic Preservation Office. Individuals who have a legitimate reason to review the forms can gain access to them in either repository.

Site Datums

Once a site was identified, a suitable location for the permanent site datum was chosen after determining the extent and general nature of the cultural materials at the site. Datums were generally placed on high locations with good visibility near the center of the artifact scatters, or they were placed immediately in front of rock shelters. Site datums consist of 45-cm lengths of steel reinforcing bar, which were pounded at least halfway into the ground. Stones were piled around datums in locations where only exposed bedrock existed. US Army "dog" tags with hand-stamped site numbers were securely attached to the bar using stainless steel wire. A master list of site numbers was established at the beginning of the each season, and crew chiefs were responsible for signing out a sufficient block of site tags each day.

Site Geographical Positioning

The approximate location of the site datum was determined using a Trimble Pathfinder Global Positioning System (GPS). These units provide an initial accuracy only to within approximately 100 m because GPS signals are encrypted in such a manner as to limit the accuracy of units available to the public. The level of accuracy can be increased to between 2-5 m when the data files generated by the GPS unit are differentially corrected. The Trimble Pathfinder GPS units used on this project were set to collect at least 180 point readings at each site datum. Differential correction of the raw data points involves the concurrent collection of GPS readings at a base station maintained at Fort Carson. Because the exact location of the base station is known, it is possible to correct for the error in the GPS readings taken at the base station. Since the error is systematic, the rover or field GPS units will have received readings with the same degree of error as the base station. A software program called PFINDER, which is provided with the GPS units, compares the base station files with the rover files, calculates the degree of error at the base station, then applies a correction function to the rover files.

Also available to the field crew, was a National Park Service representative who operated a military GPS (known as a "Plugger"). This unit is capable of between 10- to 15-m-level accuracy, since it incorporates software that deciphers encrypted GPS signals.

The considerably greater initial accuracy of the "Plugger" unit provides a few distinct

advantages. First, crews were better able to organize and maintain uniform transect coverage because it is possible to rapidly determine nearly exact positions in difficult terrain. This is especially useful in large areas of level terrain that lack prominent geographic features or have heavy tree cover that limit opportunities to take compass bearings on surrounding geographical features. Second, the precision of their coordinate readings makes them useful for defining site boundaries on large sites in difficult terrain.

Once a site was found, we plotted its location on a 7.5' U.S.G.S. topographic map, using the initial GPS coordinates as a guide. Crew chiefs were instructed to plot the site in the location they thought it should be based on nearby landforms and triangulating their position using a compass and at least two points already located on the U.S.G.S. topographic map. The more precise locations of the sites were plotted later when differentially corrected GPS coordinates were available and the final UTM coordinates listed on the Colorado State Management Data form are those that have been differentially corrected.

Site Photographs

At least one site overview photograph was taken at each site identified during the survey. Canon cameras with data imprint backs were employed in this task. These cameras automatically record the date of each photograph in the lower right hand corner, and this information is useful in sorting out photographs. Additional photographs were taken of any features. Sites were photographed using Kodak T-MAX black-and-white film. Sites with stone architecture or other features were revisited by a photographer (Hadley Harper) who used 35-mm cameras to expose a series of photographs to document the condition of standing walls or site features that might be damaged easily by visitors. Both color slides and black-and-white exposures were taken to document these features.

Sketch Maps

Scaled sketch maps were made in the field for all historic or prehistoric sites. To facilitate drawing and measurement of dimensions, sketch maps were sometimes aligned based on the topography at the site (i.e., north is not necessarily at the top). A compass was used to take bearings, and distances were paced from the datum. Site boundaries, features, artifact concentrations, and the locations of all stone tools were placed on the map using this method. Contour lines were usually approximated on the sketch maps, generally using the U.S.G.S. topographic map as a guide. If present in the vicinity, prominent features such as roads or fence lines were also included on maps.

North was recorded on all maps, as well as an approximate scale, and a key to any symbols used in the map. Smaller scale and more detailed plan views were made for cultural features. Both plan views and front-to-back cross sections were drawn for most rockshelters. Plan views indicated any associated features (architectural and non-architectural), point provenance artifacts, prominent natural features, and the dripline for rock shelters.

Isolated Find Recording

Recording procedures for isolated finds consist of completing a State of Colorado Isolated Find form, and plotting the location on a U.S.G.S. 7.5 minute series topographic map. Because of the time required, GPS post-processing is not done for isolated finds, but UTM information was derived from the plot on the U.S.G.S. topographic map. Lithic artifacts are collected using the same criteria as employed at sites, and the same analysis procedures as described below.

Quality Assurance Program

The complete and accurate collection of field data is checked by series of quality assurance procedures that are part of the daily tasks completed by crew members. Basic quality assurance is the responsibility of all crew members, and standards of professional conduct are maintained at all times. Personnel are required to briefly inspect their forms for errors and omissions in the field. Forms are then turned in to crew chiefs who also check each piece of paperwork in the field. All field forms are given to a single individual who organizes them and checks that all appropriate forms are present. This individual is responsible for submitting the forms to the laboratory at the end of each field day.

Collected artifacts are held by the crew chief who cross-checks that all the appropriate items of cultural material were collected from each site and their locations marked on the site map. The crew chief then turns in collected artifacts to the laboratory supervisor, organized by site, at the end of each field day.

Laboratory personnel input the field forms into Word-based forms. Personnel at the Red Rocks Research Facility completed this task while field investigations were in progress. The laboratory director checked entered forms for errors and omissions or errors by field personnel.

To the extent possible, site photographs were printed, labeled, and checked prior to the completion of fieldwork. A list of sites that lacked at least one photograph or appropriate photographs of features was compiled so that the sites could be revisited and photographically documented prior to the completion of fieldwork.

A laboratory crew member checked the field data forms and site maps against the collected artifacts. This individual compiled a list of errors or omissions, which were then reviewed by crew chiefs and corrections made. The concurrent laboratory input and cross-checking of all field data has two important advantages. First, the immediate checking of this data facilitates error correction—it is easier to correct mistakes when the information is still “fresh” in the mind. Second, it is possible to correct errors or omissions that cannot be resolved without revisiting the site.

Crew chiefs compiled a progress report for each 10-day session that listed the number of recorded sites, acres surveyed, and the approximate number of National Register eligible sites. These reports were used to monitor the progress of the fieldwork.

As a final quality-control measure, the principle investigator (Lawrence Loendorf) personally examined high site probability areas for unidentified sites. He also visited most National Register eligible sites to check for errors or omissions in site recording; in particular rock art, which is frequently difficult to identify.

Safety Procedures

The remote nature of the project area required close attention to a series of safety precautions established in Dean (1992). Strict adherence to these procedures was further necessitated by rugged terrain in some locations and the often-dense tree cover that limited sight distances. All safety procedures were reviewed during a meeting at the outset of the field season, and crew members were required to understand and follow these precautions. Fortunately, the 1997 field season was completed without serious mishap, which is in part the result of careful attention to the following safety procedures.

As a principal safety precaution, survey crews were issued Bendix/King radios, and a base station radio was monitored continuously at the Red Rocks research facility. These radios allow contact with Pinon Canyon Range Control personnel in case of emergency. A radio was present in each field vehicle, and crews operated handheld radios at all times when away from vehicles. Range control personnel also provided severe weather warnings or other emergency messages to both field crews and individuals at the Red Rocks research facility.

Crew chiefs informed laboratory members of the area in which they would work each day. This was done so that crews could be located during emergency situations if radio contact was not possible. Field crews were required to return to the Red Rocks research facility in the event of impending inclement weather. If multiple field crews were working, a rendezvous point was established each morning at which crews met before returning to the field camp.

First aid kits were carried in each field vehicle. These kits included materials for the treatment of minor cuts and snake bites, and crew members were required to have knowledge of basic first aid. Personnel were informed of the location of the nearest medical treatment facility in La Junta, and were instructed to break locked gates or fences in case of emergency.

Crew chiefs were responsible for maintaining contact between personnel so that they did not become separated. Crew members were instructed to wait where they were in the unlikely event that they became separated from the rest of the group. The remaining crewmembers would then organize a search working outward and starting with the last known location of the separated individual. Pinon Canyon range control personnel were to be informed if it was not possible to locate the individual by the end of normal working hours. Fortunately, no crewmembers were separated during the 1997 field season, and no search of any type was necessary.

Artifact Recording and Collection Procedures

Non-diagnostic artifacts were analyzed in the field. In addition to reducing the mass of

collected materials, field analysis allows artifacts to remain *in situ* so that future researchers can investigate previously recorded sites. Furthermore, although discrimination between artifact types is more difficult because the artifacts were not washed, it is possible to collect field data that is remarkably similar to data generated by laboratory analysis of the same artifacts.

With the exception of cores, lithic artifacts that exhibited macroscopically visible evidence of use or modification after initial removal from the core (i.e., retouched artifacts) were collected. Lithics that did not exhibit macroscopically visible evidence of use were analyzed in the field.

A form was completed for any ground-stone artifacts. This form was used for both portable and non-portable ground stone. The information collected on this form consisted largely of metric attributes of the artifacts. Only unusual ground-stone artifacts (edge-ground cobbles) were collected.

All prehistoric ceramics that were located during the survey were collected. Although ceramics were only rarely identified (sherds were collected from only eight sites), two factors suggest that ceramics may have been somewhat more common than is suggested by their low frequencies. First, most recovered sherds are small and represent a small portion of a vessel, suggesting that fragments of broken vessels may have continued to be used for purposes such as blanching grains until they were broken into tiny pieces and finally discarded. The small size of these artifacts greatly complicates their identification in the field. Second, tabular fragments of sandstone of a similar color and thickness to most sherds commonly litter the surface of the PCMS, which complicates the identification of sherds. In addition, the paste color of sherds is often very similar to the color of the soil at sites, which makes them hard to identify.

Raw material samples that encompassed the range of variation in appearance were collected from lithic procurement localities. Particular attention was given to the collection of chert samples. Nodules of stone that had not been flaked were collected when possible; however, this was not always possible, and it was necessary to collect worked nodules in some instances.

Collected historic artifacts include ceramics or bottles with maker's marks, cartridge casings, any dated and unique items. Non-collected historic artifacts were recorded on the Historic Component form, and if metal cans were present, a "Record of Cans not Collected form" was completed.

The location of all collected artifacts was indicated on the site sketch map. Artifacts were placed in a bag labeled with: site number, field specimen number, brief description of contents (e.g., corner-notched projectile point), date, and collector's initials.

Chipped-stone Analysis Procedures

The chipped-stone assemblages from sites identified in the 1997 field season were analyzed in the field with a system developed by Stanley Ahler. More detailed analyses of stone

tools were subsequently completed in the laboratory. Although this system is different from standards described in Dean (1992), generally similar data are collected using both methods. Two forms were designed for the field collection of lithic data: the Stone-Tool Inventory form, and the Chipped-stone Debitage Analysis form. This section provides a description of the data recorded on these forms, and the field procedures for the collection of this data.

Chipped-stonedebitage consists of intentionally flaked stone that does not exhibit any macroscopically visible evidence for modification after it was removed from the core. This material is generated by the controlled fracture of a lithic parent material. Stone tools are defined as chipped stone that has been macroscopically modified through use or additional flaking by controlled fracture (Ahler 1989a:129).

Macroscopically unmodified chipped-stone artifacts were classified in a system based on Ahler's (1989) approach of chipped-stone mass analysis. This type of analysis focuses on size-grade distributions of different raw material types represented in any given context. The analysis is based on the assumption that, in proportional terms, more smaller flakes were generated during the later stages of lithic reduction, though larger flakes would predominate during the earlier stages of lithic reduction strategies.

Two size grades (large and small) were used to classify flake size. Small, handheld wire mesh screens with 1/2-inch-square openings were employed to measure flakes in the field. The large size grade included flakes that would not pass in any orientation through a 1/2-inch-square screen; this included flakes with a minimum dimension greater than 0.71 inches (the diagonal of a 1/2-inch-square). The small size grade consisted of flakes that passed in any orientation through a 1/2-inch-square screen; this included flakes with maximum dimensions of less than 0.71 inches.

In addition to size grade information, flakes were classified according to material type. A number of chipped-stone raw material types are known to outcrop in the PCMS. Andrefsky (1990a) classified most of these materials. More recently, Ahler (1996) collected a number of lithic raw material samples from a variety of locations in the PCMS in order to redefine the typology and provide reference materials. The most common PCMS material types were chosen as categories for the present investigation.

Also recorded was the presence or absence of cortex (the weathering rind or natural exterior surface of the raw material). It may appear as discoloration caused by chemical weathering or as a smooth polished surface that resulted from water tumbling. Cortex was recorded as absent if no cortex was present on the dorsal flake surface or platform. Cortex was recorded as present if cortex was present in any amount on the dorsal flake surface or platform.

The macroscopically unmodified chipped stone was classified according to flake categories devised by Ahler. These categories include chunk/shatter, simple and complex flakes, bifacial-thinning flakes, and bipolar flakes.

Chunk/shatter is a generally angular piece of knappable stone that lacks features which allows determination of the dorsal or ventral surfaces or the direction of force application (i.e., it

is not possible to identify a bulb of percussion or platform). Experimental studies indicate that hard-hammer cobble testing customarily generates shatter (Ahler and Christensen 1983:187). Therefore, a high proportion of shatter in the chipped-stone debitage assemblage will be used as one indicator to identify cobble testing and early-stage lithic reduction strategies.

A simple flake is a freehand percussion or pressure flake that exhibits parts of two or fewer previous flake scars on the dorsal surface (exclusive of small platform trimming/shaping flakes). The flake may or may not retain the platform (i.e., this category includes broken flakes that lack platforms).

Complex flakes are freehand percussion or pressure flakes that lack the specialized features of a bifacial-thinning flake, but do clearly exhibit all or parts of three or more previous flake scars on the dorsal surface (exclusive of small platform trimming/shaping flakes). Once again, these flakes may or may not retain the platform.

Bifacial-thinning flakes represent technologically specialized flakes removed from a biface during mid-to-late stages of thinning. Ahler and Christensen (1983:189) identify bifacial-thinning flakes as having "a thin, flattened transverse cross-section; a thin, curved longitudinal cross-section; very acute lateral and distal edge angles associated with feather terminations, including opposite that of the subject flake; a narrow, faceted and prepared platform representing a small segment of a prepared and dull bifacial tool edge; a lipped platform; little or no cortex on the dorsal flake face; an expanding flake shape; and a diminutive, flattened or subdued positive bulb of force."

Bipolar flakes are technologically specialized flakes indicative of bipolar percussion techniques. The place of force application consists of a point or ridge, often shattered or crushed. These flakes also have evidence of opposing fracture or force applications. The distinction between the dorsal and ventral face is often difficult to determine. Linear and often parallel flake scar surfaces are apparent. Bipolar flakes tend to have angular, transverse cross-sections and a high frequency of pronounced ripple marks on flake surfaces.

Stone-Tool Analysis

Stone tools were recorded as one of three size grades (large, medium, and small), determined by using handheld wire mesh screens with ½-inch and 1-inch openings. The large size grade included stone tools that would not pass in any orientation through 1-inch-square openings; these artifacts have a minimum dimension of greater than 1.41 inches (the diagonal of a 1-inch-square opening). The medium size grade includes artifacts that will pass through the 1-inch opening, but will not pass through the ½-inch-square opening; these tools have maximum dimensions of less than 1.41 and minimum dimensions of greater than 0.71 inches. The small size grade includes artifacts that pass through the ½-inch-square mesh; these tools have maximum dimensions of less than 0.71 inches.

In addition to this information, material types were coded using the same classification system used on the flakes. Cortex presence or absence was also recorded following the criteria

employed in the flake analysis.

During the field analysis, chipped-stone tools were classified as one of eight categories; only the first five were collected and subsequently analyzed in greater detail. The categories are as follows: small, thin patterned biface (arrow point); large, thin patterned biface (dart point); other unfinished biface; patterned flake tool; retouched/utilized flake; large, crude bifacial core/tool; non-bipolar core; and bipolar tool. Bipolar reduction strategies appear to have been rarely employed, and no artifacts were classified as bipolar tools. Consequently, this artifact type is not described here.

Small, thin patterned bifaces are bifaces that have been heavily shaped by intentional secondary flaking (i.e., patterned), are small and thin in size and form (i.e., arrow point size), and exhibit only pressure flaking. This type includes both technologically finished and unfinished forms (i.e., both preforms and completed points are included).

Large, thin patterned bifaces are defined as a biface heavily shaped by intentional secondary flaking (i.e., patterned), medium to large in size and form (i.e., dart point size), and shaped by pressure flaking and/or percussion techniques with highly regularized bifacial margins. This type also includes both technologically finished and unfinished forms (i.e., both preforms and completed points are included).

Other large patterned bifaces included any other large, thin biface that lacked hafting elements and may have been used as handheld cutting implements; however, macroscopic evidence of use was not necessary for inclusion in this category. These items may be technologically finished or unfinished.

Patterned flake tools were defined as a flake tool with secondary flakes removed to produce a form or outline intended by the knapper (e.g., end scraper). This category was further divided into several types during subsequent laboratory analysis, including end scraper, side scraper, or drill.

Other retouched and/or utilized flakes consisted of unpatterned flake tools with one or more edges macroscopically modified by intentional retouch and/or heavy utilization damage. The outline of these tools is largely a product of the flake blank shape rather than intentional retouch. Flakes with unpatterned retouch and utilized flakes are included in one category because it is often difficult or impossible to distinguish between them for two primary reasons. First, retouch and use involve the intentional application of force to the artifact margin. In the case of retouch, the artifact is held stationary and force is applied using an implement, whereas with utilization, the artifact may be pressured against a stationary object. However, despite this difference, the two processes may produce identical results. Second, most retouched artifacts are also utilized, making it impossible to completely separate these categories.

Large, crude bifacial core tools consist of thick cores modified by bifacially directed percussion flaking, often with very sinuous or irregular edges. These artifacts may or may not have macroscopic evidence for use wear (i.e., the category includes both cores and bifacially

reduced artifacts that may themselves have been used as tools).

Non-bipolar cores consist of any core or core-like tool produced by freehand (non-bipolar) percussion flaking. These artifacts sometimes exhibited intensive battering along on the ridges between flake scars. One possibility to account for this battering is that the artifacts may have been used as pecking stones to roughen the grinding surfaces of metates.

Further laboratory analysis was completed for artifacts in stone tool categories 1 through 5, that were collected, and this information is presented in Chapter V. These artifacts were collected because their greater degree of culturally induced patterning allows the use of more meaningful analytical procedures, particularly chronological estimates in the case of projectile points. Metric attributes were recorded according to standards described in Dean (1992).

Ground-stone Analysis Procedures

Both portable and non-portable ground stone were analyzed in the field on a Ground-stone Inventory form that combined data previously collected on non-portable ground-stone forms and during laboratory analysis. Results from this analysis are presented in Chapter VII. Some attributes were recorded for all ground stone, whereas other attributes are applicable only to particular types of ground stone. Recorded attributes are based on ground-stone analysis procedures described in Dean (1992), with the exception of weight, which was only recorded for collected ground-stone artifacts.

Data collected for all ground-stone artifacts, regardless of completeness, included: shape (oval, round, rectangular, square, or irregular); material type (basalt, sandstone, chert, quartzite, or limestone); completeness (whole, <50 percent, or >50 percent); degree of use wear (light, moderate, or heavy); technology (pecked, flaked, ground, and/or polished); striations on the working surface (longitudinal, oblique, transverse, multiple, or undetermined); metric attributes, including overall length and width to the nearest centimeter, and the length and width of grinding surfaces.

Ground-stone artifacts were classified into 6 basic categories, including: mano, metate, mortar, palette, edge-ground cobbles, and milling slabs. Mortars were not identified during the survey and are consequently not described here.

Manos consist of grinding artifacts that appear to have been used in a handheld fashion and were classified as either one-hand or two-hand based on size. These artifacts were generally oval-shaped cobbles with one or more grinding surfaces distinguished by smoothing, the planing of high points, sometimes polishing, frequently striations, and usually wear facets (i.e., sometimes subtle ridges along one or more margins of the grinding surface). Of these, the planing of high points and wear facets, are most important for distinguishing culturally induced grinding, because natural processes (especially water tumbling) can also produce smoothing and polishing. Because of the geological setting, however, water-tumbled and worn cobbles are largely not present in the project area; any such cobbles identified in the project area are probably minimally manuports. Further complicating the situation, most manos were made from stream-

worn cobbles that were probably obtained from the Purgatoire River Valley.

Metates consist of both portable slabs with ground surfaces and bedrock outcrops with ground surfaces. Smoothing, the planing of high points, sometimes polishing, and frequently striations distinguished surfaces that had been ground.

Palettes are tabular artifacts with finely ground and polished surfaces that are flat and lack any kind of depression. Usage can be seen on one or both faces, and no obvious surface modification (battering) is present. The occasional presence of pigment adhering to the surface indicates that this tool class was used to grind pigment.

Edge-ground cobbles are handheld tools that are generally oval in shape, with one or more ground edges that are parallel to the long axis and perpendicular to the short axis. The ground edges are convex to straight in plan view and often display striations oriented 90° from the long axis. Darroch (1974) indicates that these implements were presumably used primarily to process hides or, in some cases, were involved in the production of lithic debitage.

Milling slabs are tabular implements that are generally thought to be smaller than slab metates and are considered to be portable. There is an indistinct break between what might be defined as a milling slab and a flat metate for artifacts in fragmented condition. Unlike slab metates, these artifacts are less likely to be formally modified along the edges or on the surfaces.

Other Analyses

The ceramics were sent to Nicola Straziciche, adjunct faculty member at the University of Washington in Seattle, for paste, vessel form, and temper descriptions and analysis. The results of her work are presented in Appendix II. All obsidian encountered during the survey was collected. The obsidian was sent to Chris McKee at the New Mexico Bureau of Mines and Mineral Resources for x-ray fluorescence. Raymond Kunselman from the University of Wyoming's Department of Physics then analyzed the results of the x-ray fluorescence to determine source locations. The letter report outlining the results can be found in Appendix III.

Chapter III: Eligible Sites

Three hundred twenty-five previously unrecorded sites were located during the 1997 Archaeological Sites Inventory of the Black Hills. Results from the fieldwork indicate that 41 sites should be nominated to the National Register and a total of 284 sites should not be considered as eligible for the National Register and require no further work. In this chapter, the sites that are recommended as eligible to the National Register are discussed in detail and justifications as to their eligibility and management recommendations are presented. The remaining 284 non-eligible sites are described in Appendix I. A descriptive table that summarizes selective information about all the recorded sites can be found in Appendix IV.

5LA7268

This site is a lithic scatter located along the western portion of the project area. The site sits in a narrow wash nestled between two low ridges of yellowish-colored Dakota sandstone. A small drainage nearly bisects the site, and another is located just to the south of the site. The site covers an area of approximately 0.4 acres and has a somewhat high density of flakes and other artifacts just north of the datum (Figures 3.1 and 3.3). The site datum sits at an elevation of 1,585 m (5,200 ft) asl. Little topographic relief is present, with the eastern part of the site approximately 2 m higher than the western part.

Juniper scrub is the vegetative community that dominates the site and the surrounding area. In addition to juniper, narrow-leaf yucca, cholla, and grama grasses were seen growing on the site. Soil deposition at the site is considerable, with depths of up to 40 cm recorded; however, no surface indications of thermal features were noted.

One hundred percent of the flakes on the surface were recorded and collected (Table 3.1). The collection was carried out in order to implement and evaluate the lithic analysis method used in this report. A total of 79 pieces of chipped-stone debitage were recorded from the site. Only three material types were noted. Of the total, 86% is quartzite, 13% is chert, and 1% is hornfels/basalt. Of the quartzite debitage, 57% falls into the large size grade, while 43% is recorded as small; 29% of the debitage has cortex and 71% is noncortical; and 37% is recorded as complex flakes, 3% as shatter, and 60% as simple flakes.

The quartzite debitage appears to have been generated by freehand percussion techniques (Figure 3.2). The small, cortical, quartzite flakes (33%) plot higher than the average for all sites recorded in the survey (26%), which indicates that the earlier stages of lithic reduction were the most common lithic reduction strategy responsible for generating the quartzite debitage at the site. Counts for chert and hornfels/basalt are too low for meaningful analysis.

Unfortunately, no temporally diagnostic materials, such as projectile points or ceramics, were recorded from the site. Little can be said of how the site fits into the regional chronology.

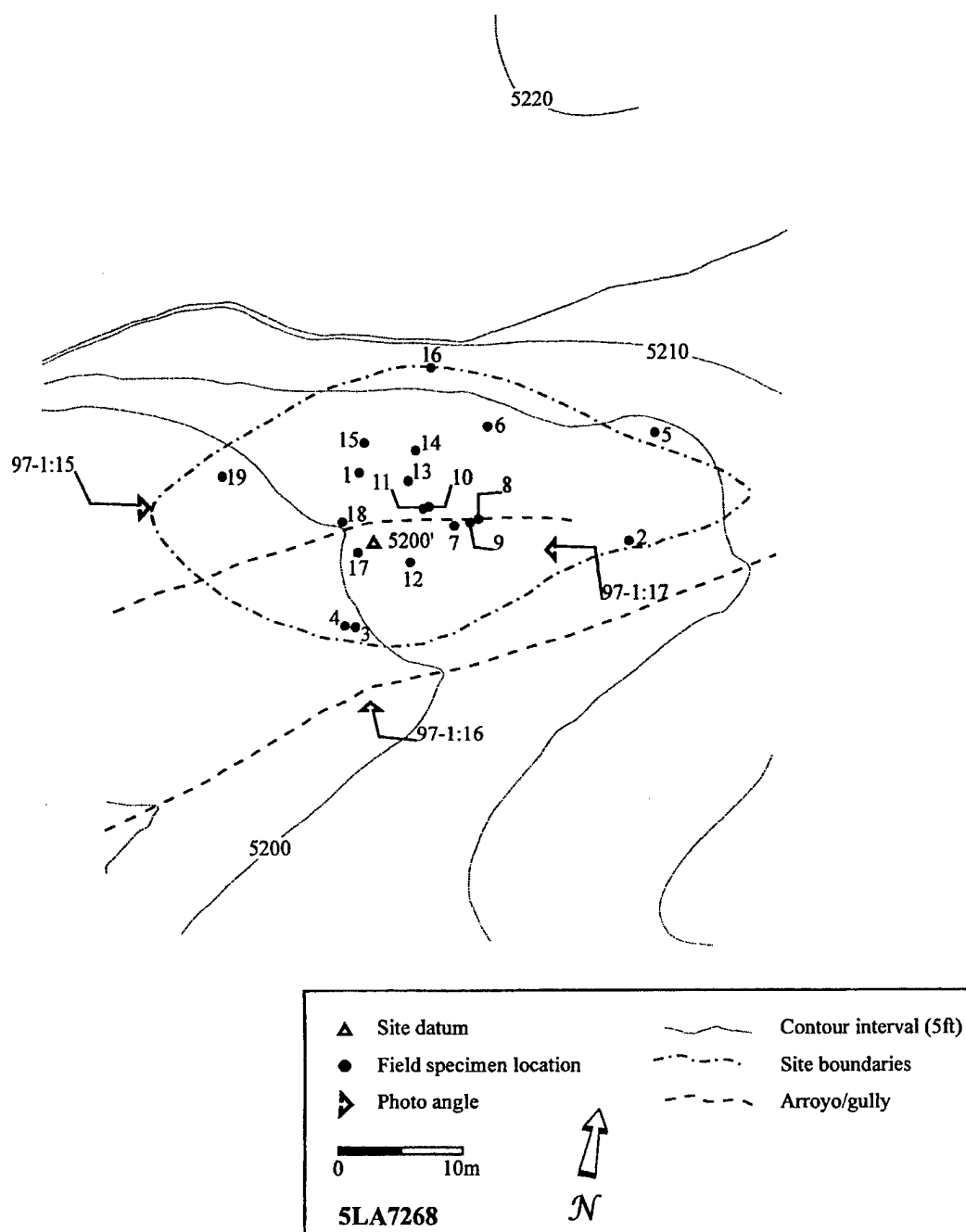


Figure 3.1: Site map, 5LA7268.

Table 3.1: Summary Description of Chipped-stone Debitage for 5LA7268.

	Chert	Hornfels/Basalt	Quartzite
Total flakes	10	1	68
Large	6	0	39
Small	4	1	29
Cortical	0	0	20
Noncortical	10	1	48
Complex	0	0	25
Shatter	5	0	2
Simple	0	0	41
Bifacial-thinning	1	1	0
Bipolar	4	0	0

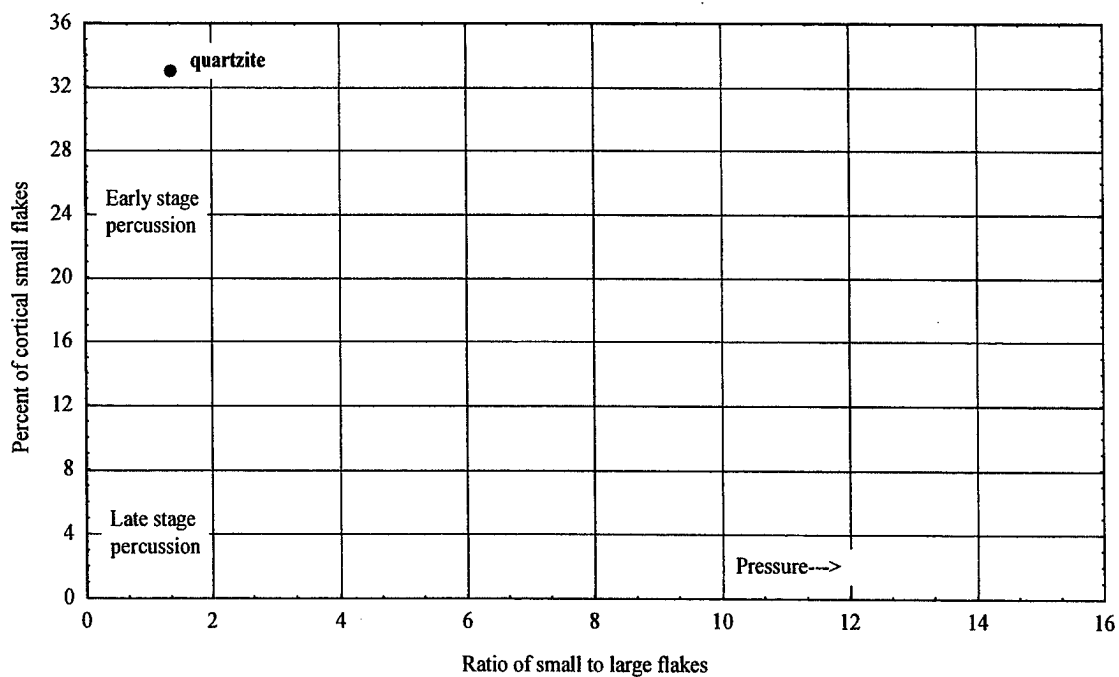


Figure 3.2: Scatter plot of quartzite debitage from 5LA7268.



Figure 3.3: Photograph of site 5LA7268. Site overview, view to southeast.

Three manos were found at the site (FS 15, 17, and 18). Two of these are made from sandstone and one is quartzite. A piece of worked kaolinite that may be a pendant (FS 16) was also found approximately 25 m and 20 degrees from the site datum at the northern boundary of the site, just south of the ridge.

The stone-tool assemblage consists of eleven artifacts, of which four are bifaces, four are non-bipolar cores, two are end and side scrapers, and one is a retouched uniface tool. Of the bifaces, three of the four specimens are broken. Two are fine-grained quartzite, one is coarse-grained quartzite, and one is argillite. None exhibit use wear, three are unfinished, and one is finished. Material types for the cores are chert (2) and quartzite (2). Both of the end and side scrapers are complete. The chert specimen is finished and exhibits moderate to heavy use wear on the right lateral edge and distal end. The fine-grained quartzite specimen is nearly finished, and shows light use wear on the distal end and left lateral edge. The uniface is complete, made of fine-grained quartzite, and shows light-to-moderate use wear on the left lateral edge and an irregular portion of the right lateral edge.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The potential of buried, intact, cultural deposits and the presence of ground stone may indicate that pollen, faunal, and macrobotanical remains useful in reconstructing subsistence and paleoenvironment will be recovered through excavations. The site does not appear to be in imminent danger of impact and should be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for the presence of subsurface deposits should be noted, then tested. If intact cultural deposits are encountered, then the site should be fenced for its protection.

5LA7270

The site is a lithic scatter located along the western portion of the project area among the numerous small drainages that dissect the slopes leading from the Black Hills to the plains on the west. Site 5LA7270 is located at the head of a rather large tributary canyon to Stage Canyon (Figure 3.4 and 3.5). The majority of this site is situated on the slopes leading to the drainage. The site datum is at an elevation of 1,558 m (5,110 ft), with elevations ranging from approximately 1,561 m (5,121 ft) asl to a low point of nearly 1,557 m (5,107 ft) asl. The site covers an area of nearly 1 acre.

Juniper scrub is the vegetative community that dominates the site and the surrounding area. In addition to juniper, cholla and grama grasses were seen growing on the site when it was recorded. Soil deposition at the site reaches depths of at least 30 cm in some areas; however, there were no surface indications of thermal features.

One hundred nineteen pieces of chipped-stone debitage were recorded at the site (Table 3.2). This figure represents the total number of flakes seen resting on the ground surface at the time the site was recorded. Six material types were noted. Of the total debitage, 24% is quartzite, 60% is chert, 14% is argillite and there is one flake each of chalcedony, hornfels/basalt, and obsidian.



Figure 3.4: Photograph of site 5LA7270. Site overview, view to southeast.

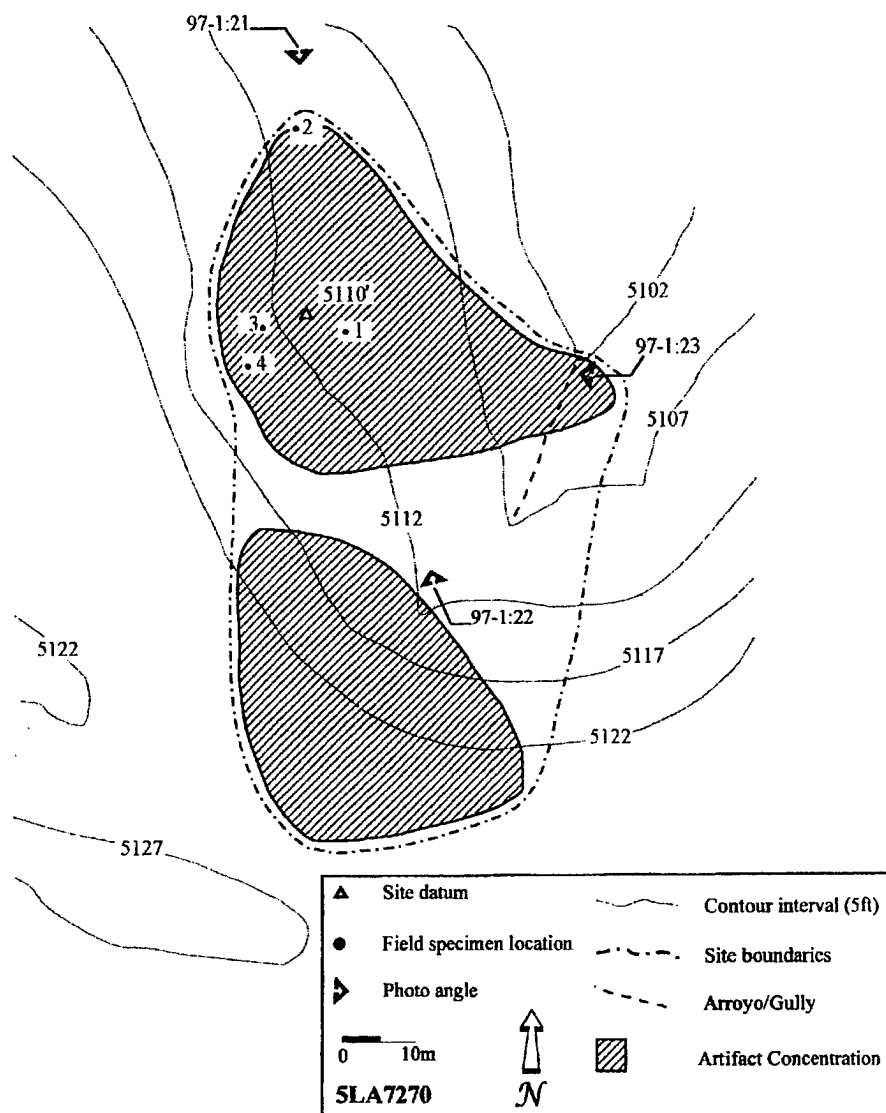


Figure 3.5: Site map, 5LA7270.

Site 5LA7270 is one of the few eligible sites found in the Black Hills in which chert debitage is a more common raw material than quartzite. Of the quartzite debitage, 38% falls into the large size grade, while 62% is recorded as small; 10% of the debitage has cortex and 90% is noncortical; and 48% is recorded as complex flakes, 38% as simple flakes, and 14% as bifacial-thinning flakes. Of the chert debitage, 6% is large and 94% is small; 10% has cortex and 90% is noncortical; and 69% is classified as complex flakes, 27% as simple flakes, and 4% as bifacial-thinning flakes. Even though the count for argillite debitage is low (16), it is included in this analysis since its pattern appears to be strong enough to at least suggest the trend of lithic reduction for this material type. Of the argillite debitage, none is large, while 100% is recorded as small; 25% of the debitage has cortex and 75% is noncortical; and 6% is recorded as complex flakes, 81% as simple flakes, and 13% as bifacial-thinning flakes.

Figure 3.6 shows a scatter plot of the quartzite, chert, and argillite debitage and indicates that a somewhat complex and mixed set of lithic reduction strategies were employed at the site. Based on the plot, it appears that freehand percussion was likely the most important technique in generating the quartzite debitage; however, both the argillite and chert debitage have a large ratio of small-to-large flakes. This pattern indicates that perhaps some pressure flaking was responsible for generating the debitage of those material types. The plot of the argillite debitage is somewhat difficult to interpret since it indicates a large percentage of small cortical flakes, which is counter intuitive to the conclusion that the debitage was generated primarily by pressure flaking. The presence of two bifacial-thinning flakes indicates that some argillite biface production was occurring on site. It also seems likely that at least some portion of the argillite debitage was produced by free hand percussion in the early stages of lithic reduction, and the initial size of the argillite cores worked at the site were somewhat small.

The chert debitage is the result of a mix of early- and late-stage lithic reduction. The presence of three bifacial-thinning flakes indicates that the production of chert bifaces was an activity carried out at the site. The frequency of small quartzite debitage is somewhat low (18) and may be skewing the results. The quartzite plots high on the scatter; however, the percentage of quartzite cortical, small flakes is low for that material type and may indicate that some tool manufacture/maintenance was carried out along with early-stage activities.

No temporally diagnostic materials, such as projectile points or ceramics, are recorded from the site. Little can be said of how the site fits into the regional chronology.

The flaked tool assemblage consists of three artifacts. Of these, one is a biface fragment, one is a broken uniface tool, and one is a complete utilized flake. The biface is nearly finished and is made of obsidian. It exhibits retouch modification on both faces and light use wear on the lateral edges. The unfinished uniface tool is limestone. Heavy edge weathering makes usage impossible to determine; however, purposeful retouch modification is shown on one face. The utilized flake is fine-grained quartzite and displays light use wear on the steep edge of the distal end.

Two pieces of obsidian were recovered from the surface of the site and submitted for sourcing (Appendix III). Both specimens (5LA7270.0.1 and 5LA7270.0.12) come from the Cerro del Medio source locale of the central portion of the Jemez Mountains of New Mexico.

Table 3.2: Summary Description of Chipped-stone Debitage for 5LA7270.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Obsidian	Quartzite
Total flakes	16	1	71	1	1	29
Large	0	0	4	1	0	11
Small	16	1	67	0	1	18
Cortical	4	0	7	0	0	3
Noncortical	12	1	64	1	1	26
Complex	1	0	49	0	0	14
Shatter	0	0	0	0	1	0
Simple	13	1	19	1	0	11
Bifacial-thinning	2	0	3	0	0	4
Bipolar	0	0	0	0	0	0

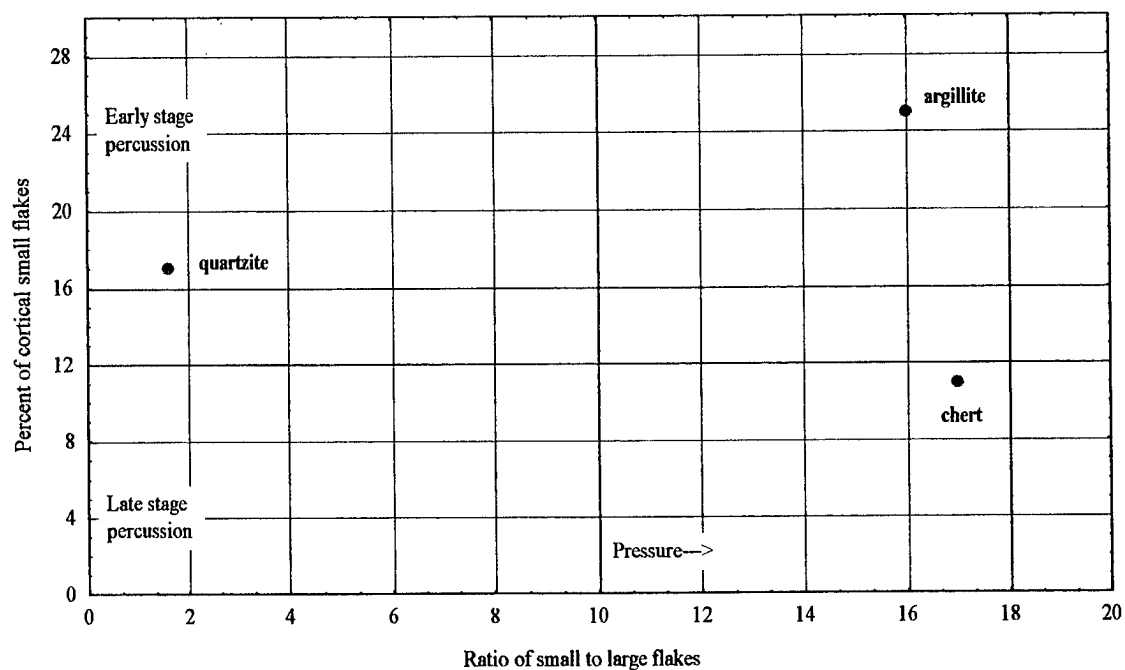


Figure 3.6: Scatter plot of argillite, chert, and quartzite debitage for 5LA7270.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The site was apparently extensively used in the production or maintenance of chipped-stone tools. The presence of five bifacial-thinning flakes indicates that some working or the production of bifaces was carried out at the site. No surface indications of thermal features were noted, but soil deposition of over 30 cm may be covering intact, buried deposits. We recommend that the site be revisited for more detailed mapping and surface collection. Test excavations may reveal the presence of discrete activity areas related to tool production. There is also the possibility of recovering data such as pollen, macrobotanical, and/or faunal remains if a subsurface, thermal feature is encountered. If subsurface cultural deposits are encountered through test excavations, then the site should be fenced for its protection.

5LA7277

The site is a lithic scatter located along the western portion of the project area among the numerous small drainages that dissect the slopes from the Black Hills to the plains on the west (Figure 3.7). Site 5LA7277 is located on a low ridge and extends into the slopes of a small drainage. Two higher ridges border the site area to the northwest and southeast. The site datum is at an elevation of 1,542 m (5,060 ft) asl with elevations ranging from approximately 1,538 m (5,045 ft) asl in the drainage to 1,542 m (5,060 ft) asl just east of the datum. The site covers an area of approximately 1.5 acres.

Juniper scrub is the vegetative community in the area around the site. Grama grasses, mountain mahogany, mamillaria, *Rhus trilobata*, Indian paintbrush, mullein, and perhaps rice grass were seen growing on the site. Soils of up to 20 cm were noted, but less than 10 cm was apparent in most parts of the site.

Only 59 pieces of chipped stone were recorded from the site (Table 3.3). This figure represents the total number of flakes seen resting on the ground surface at the time the site was recorded. Of the total debitage, 46% is quartzite, 41% is chert, 7% is hornfels/basalt, 3% is quartz, and there is one flake each of chalcedony and silicified wood. Given the low frequency of flakes the diversity of material types seems somewhat high. Of the quartzite debitage, 93% falls into the large size grade, while 7% is recorded as small; 37% of the debitage has cortex and 63% is noncortical; and 26% is recorded as complex flakes, 4% as shatter, and 70% as simple flakes. Of the chert debitage, 8% is large and 92% is small; 29% is cortical and 71% is noncortical; and 54% is classified as complex and 33% as simple.

The chert debitage has a large ratio of small-to-large flakes, indicating that perhaps some pressure flaking was responsible for generating the debitage of that material type (Figure 3.8). Somewhat at odds with this interpretation is the chert debitage, which exhibits a relatively high percentage (23%) of cortical, small flakes indicating some early-stage lithic reduction was carried out at the site. The overall pattern for the chert debitage is similar to that described for the argillite debitage of site 5LA7270, which may indicate that the initial size of the chert cores worked on at 5LA7277 was small. The counts for the remaining material types are too small for meaningful analysis.

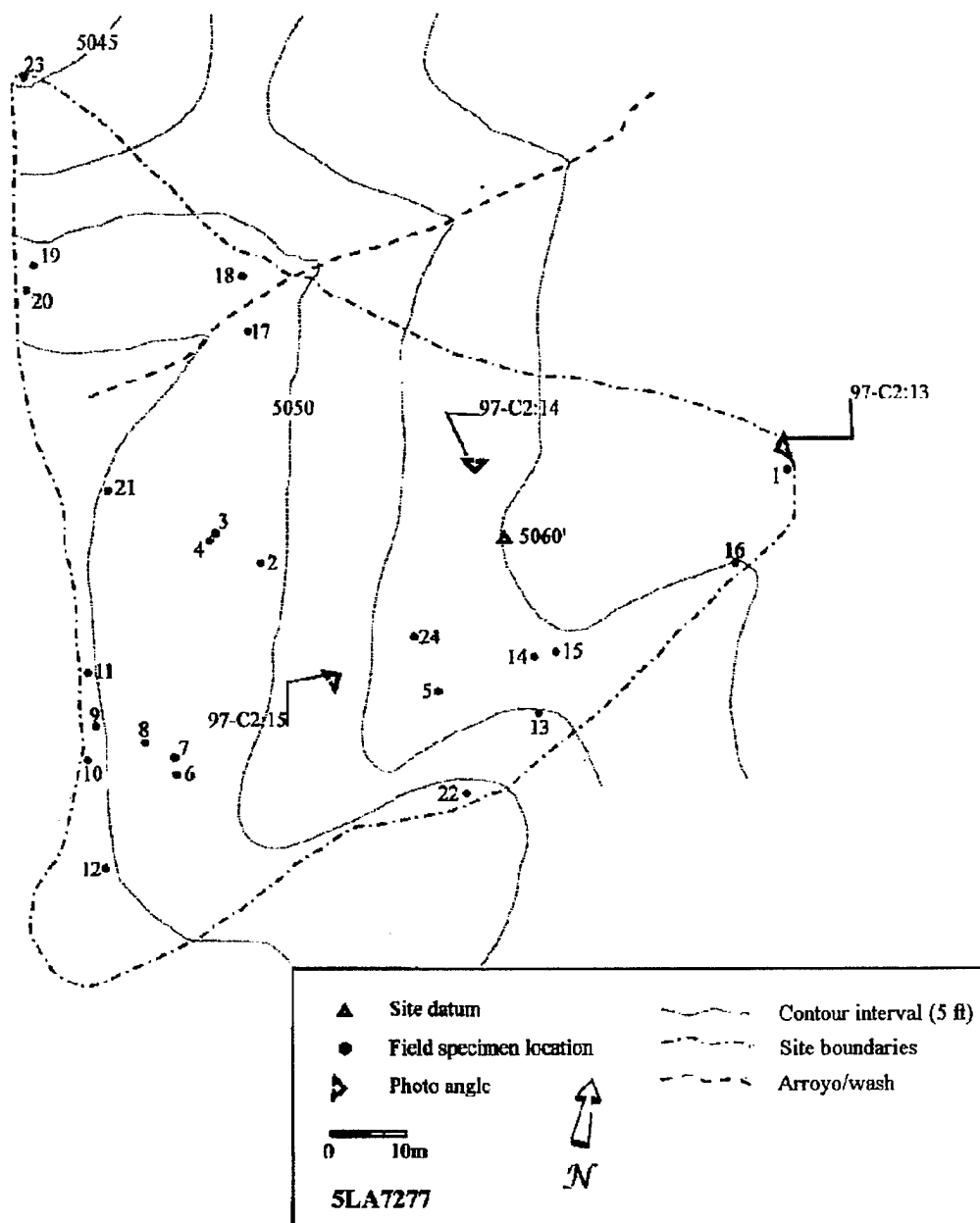


Figure 3.7: Site map, 5LA7277.

Table 3.3: Summary Description of Chipped-stone Debitage for 5LA7277.

	Chalcedony	Chert	Hornfels/Basalt	Quartz	Quartzite	Silicified Wood
Total flakes	1	24	4	2	27	1
Large	0	2	2	2	25	1
Small	1	22	2	0	2	0
Cortical	0	7	0	1	10	1
Noncortical	1	17	4	1	17	0
Complex	1	13	2	1	7	0
Shatter	0	3	0	0	1	0
Simple	0	8	1	1	19	1
Bifacial-thinning	0	0	1	0	0	0
Bipolar	0	0	0	0	0	0

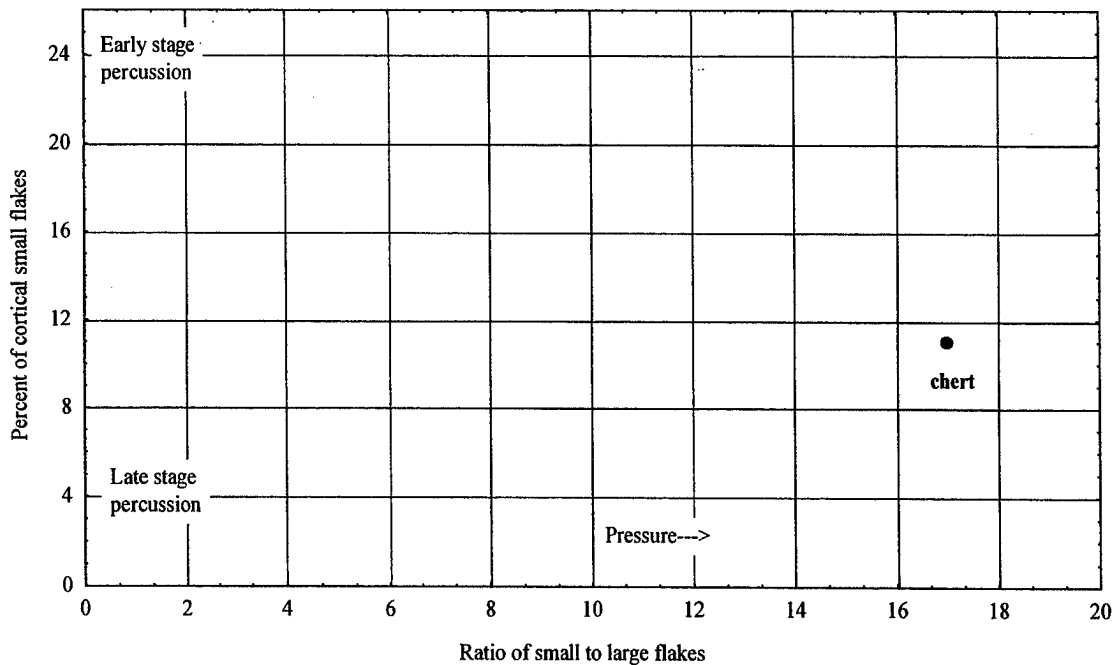


Figure 3.8: Scatter plot of the chert debitage for 5LA7277.

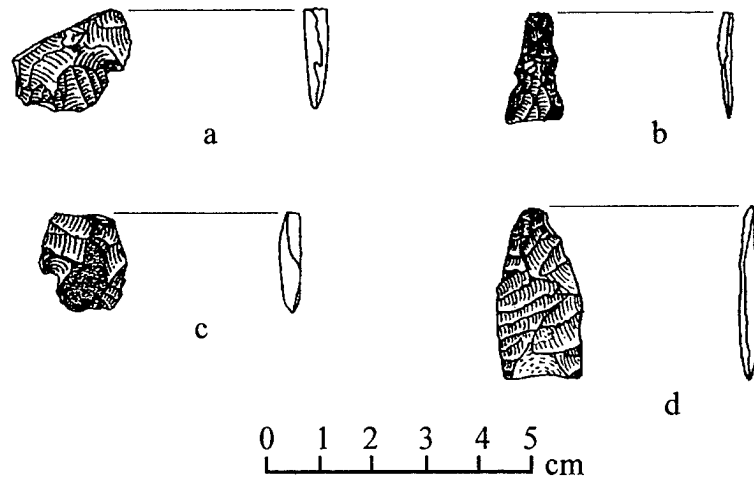


Figure 3.9: Projectile points recovered from site 5LA7277: (a) 5LA7277.0.6; (b) 5LA7277.0.4; (c) 5LA7277.0.22; (d) 5LA7277.0.3.

Four projectile points were recovered from the surface of this site, of which two are temporally diagnostic. The first point (5LA7277.0.6) is similar to Anderson's (1989) type P35. This type is associated with dates that range between 1000 B.C. to A.D. 1200. The second projectile point (5LA7277.0.3) is a P49 and ranges in time between A.D. 800 and A.D. 1750. Based on these two artifacts, the site likely had an occupation in the Ceramic stage (A.D. 200 to A.D. 1750) and perhaps an earlier occupation during the Late Archaic (1000 B.C. to A.D. 200).

Ground stone is represented by a single bedrock metate or grinding surface on a boulder (Feature 1, FS 24) located about 18 m to the southwest of the site datum. The surface exhibits light grinding over an area measuring 23 x 16 cm.

Sixteen artifacts comprise the flaked tool assemblage. Of these, six are utilized flakes, five are bifaces, three are non-bipolar cores, one is a drill, and one is a retouched uniface tool. Material types for the cores are quartzite (2) and chert (1).

The utilized flakes are chert (2), argillite (1), obsidian (1), quartzite (1), and siltstone (1). Four of the six specimens are broken. Five exhibit light use wear and one was moderately used. Use locations for the utilized flakes are both lateral edges (2), the right lateral edge (3), and distal end (1). The majority (5) have edge angles less than 45 degrees, which indicates the primary function was cutting.

All of the bifaces are quartzite, of which three are coarse-grained and two are fine-grained. Four of the five are unfinished and one is nearly finished. None of the bifaces show use wear and only two are complete. The drill specimen is a finished bit fragment made of chert, with heavy use wear on one lateral edge. The uniface tool specimen is complete, finished, and made of chert. Light use wear is seen on the steep, right lateral edge, which suggests scraper usage.

One piece of obsidian (5LA7277.0.5) was sourced (Appendix III) to the Polvadera Peak region of the northern Jemez Mountains of New Mexico.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The site is large, with some areas of soil deposition, especially on the flats below the ridge. These soils may be covering intact, buried cultural deposits. Several tools were recorded, as well as a temporally diagnostic projectile point (Archaic in style). Several pieces of exotic chert and obsidian are also recovered from the site and may contribute to an understanding of trade and exchange. Test excavations may reveal the presence of data such as pollen, macrobotanical, and/or faunal remains useful for reconstructing paleoenvironment and subsistence patterns. The site does not appear to be in imminent danger. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for subsurface, cultural deposits should be noted and test excavations carried out. If buried cultural deposits are encountered, the site should be fenced for its protection against potential impact from military activities.

5LA7281

The site is a lithic scatter located in the western portion of the project area near the top of the ridge that forms the Black Hills (Figure 3.10 and 3.11). It is situated in an area of only slight topographic relief and covers approximately 1 acre. The site datum is at an elevation of ,1588 m (5,210 ft) asl, and the site gently slopes about 2 m to the east.

Juniper scrub is the vegetative community in the area around the site. Grama grasses, yucca, ricegrass, penstemon, and cholla were seen growing on the site. Soils of up to 20 cm were noted on site.

A small rock cairn (Feature 1) was noted at 105 m and 200 degrees from the site datum. The cairn is composed of sandstone cobbles stacked to a maximum of three courses. Some soil deposition is present around the cairn, and it may be partially buried. Two main artifact concentrations were also noted. One is located around the site datum and measures approximately 20 x 12 m. The northern edge of the second concentration is located approximately 30 m south southwest of the site datum and measures approximately 25 x 18 m.

Since our intrasite collection strategy was not truly random, the following analytical description may not fully represent the range of variability present at the site. A total of 141 pieces of chipped-stone debitage were recorded from the site (Table 3.4). This represents an unsystematically selected sample of the total number of flakes seen resting on the ground surface at the time the site was recorded. Of the total debitage, 69% is quartzite, 18% is chert, 7% is hornfels/basalt, 3% is argillite, 1% is obsidian, and there is one flake each of chalcedony and quartz. Of the quartzite debitage, 73% falls into the large size grade, while 27% is small; 32% has cortex and 68% of the debitage is noncortical; and 50% is complex flakes, 4% shatter, and 46% simple flakes. Of the chert debitage, 35% is large and 65% is small; 88% is noncortical and 11% is cortical; and 35% is classified as complex, 19% as shatter, and 46% as simple.

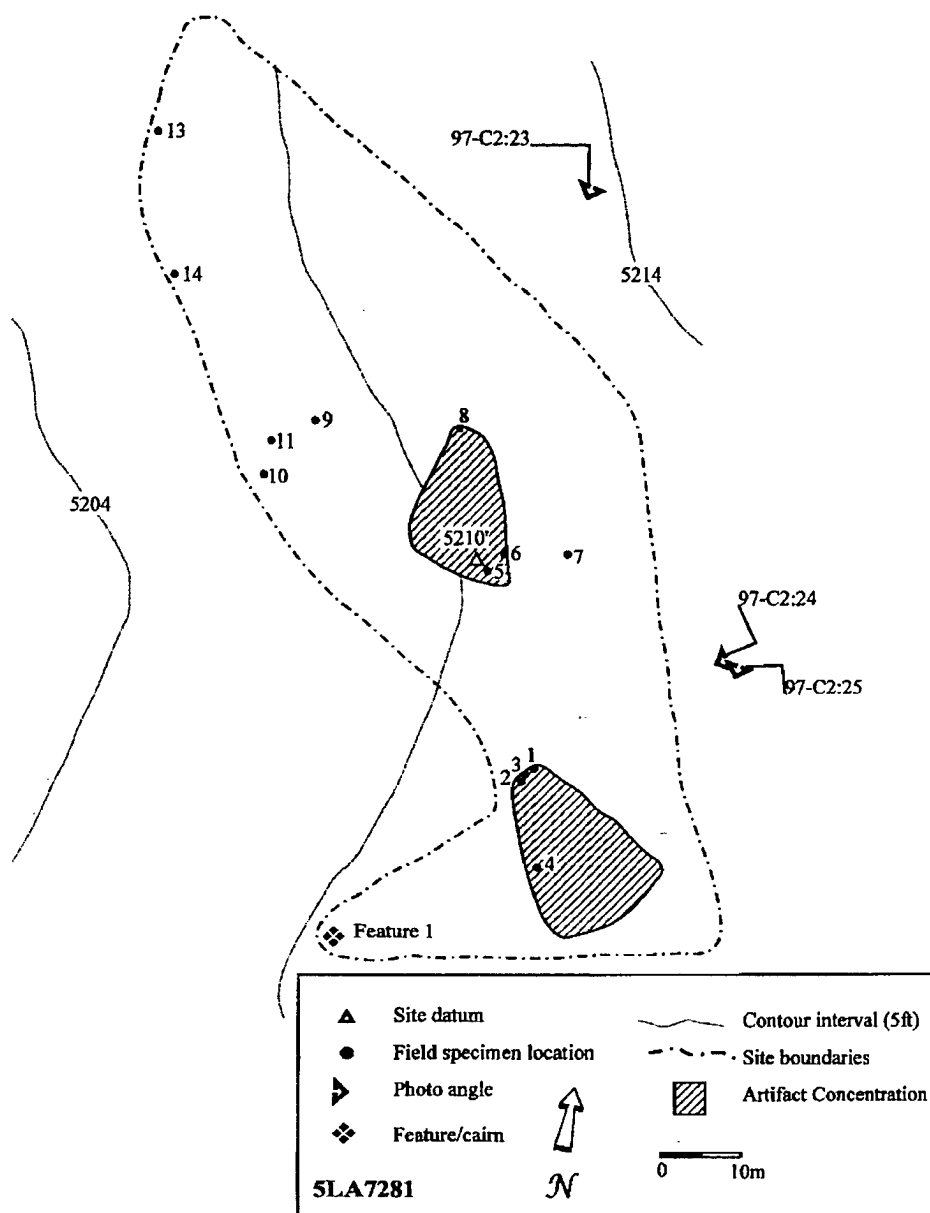


Figure 3.10: Site map, 5LA7281.

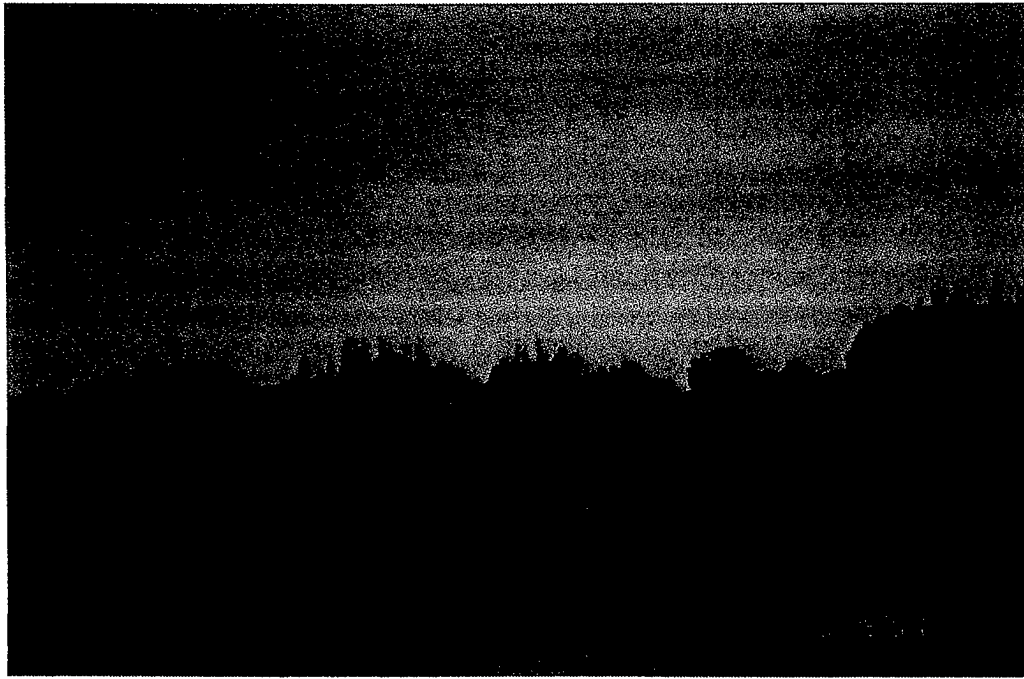


Figure 3.11: Photographs of site 5LA7281. Black Hills two-track in bottom left corner.

Figure 3.12 shows a scatter plot of the quartzite debitage; the count of small chert flakes is too low (17) to obtain meaningful results from a plot. Based on this figure, it appears that freehand percussion was the most important technique in generating the quartzite debitage. The quartzite debitage also plots out lower than the average for that material type. This pattern may suggest that, at least in part, some later stage reduction of quartzite occurred at the site. The counts for the remaining material types are too low for meaningful analysis.

A single temporally diagnostic projectile point (5LA7281.0.3) was recovered from the surface of the site (Figure 3.12). This specimen is similar to Anderson's (1989) type P83 and has a range from A.D. 750 to A.D. 1650. This time range suggests a somewhat late occupation that certainly falls within the Ceramic Stage (A.D. 200 to A.D. 1750) and likely towards the later end (ca. A.D. 1200-1650). This inference is partially supported by a single piece of ceramic that was recovered from the surface approximately 27 m northwest of the site datum. The specimen is a small, cord-marked rim sherd. Unfortunately, this sherd was not included in the analysis described in Appendix II, but it resembles Hummer's (1989) Category 4, which can be cross-dated to similar types from the Middle Woodland Upper Republican (Plains Village period, A.D. 1050-1450) or Middle Woodland Apishapa phase pottery (A.D. 1000-1300).

The tool assemblage consists of two nearly finished bifaces, one unfinished biface, and one core. Of the bifaces, two are quartzite, and one is hornfels/basalt. All show purposeful retouch on both faces, with no visible use wear present. The non-bipolar core is complete and made of chert.

Table 3.4: Summary Description of Chipped-stone Debitage for 5LA7281.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Obsidian	Quartz	Quartzite
Total flakes	4	1	26	10	2	1	97
Large	1	0	9	6	1	1	71
Small	3	1	17	4	1	0	26
Cortical	2	0	3	1	0	0	31
Noncortical	2	1	23	9	2	1	66
Complex	2	0	9	3	1	0	48
Shatter	0	0	5	1	0	0	4
Simple	2	1	12	6	1	1	45
Bifacial-thinning	0	0	0	0	0	0	0
Bipolar	0	0	0	0	0	0	0

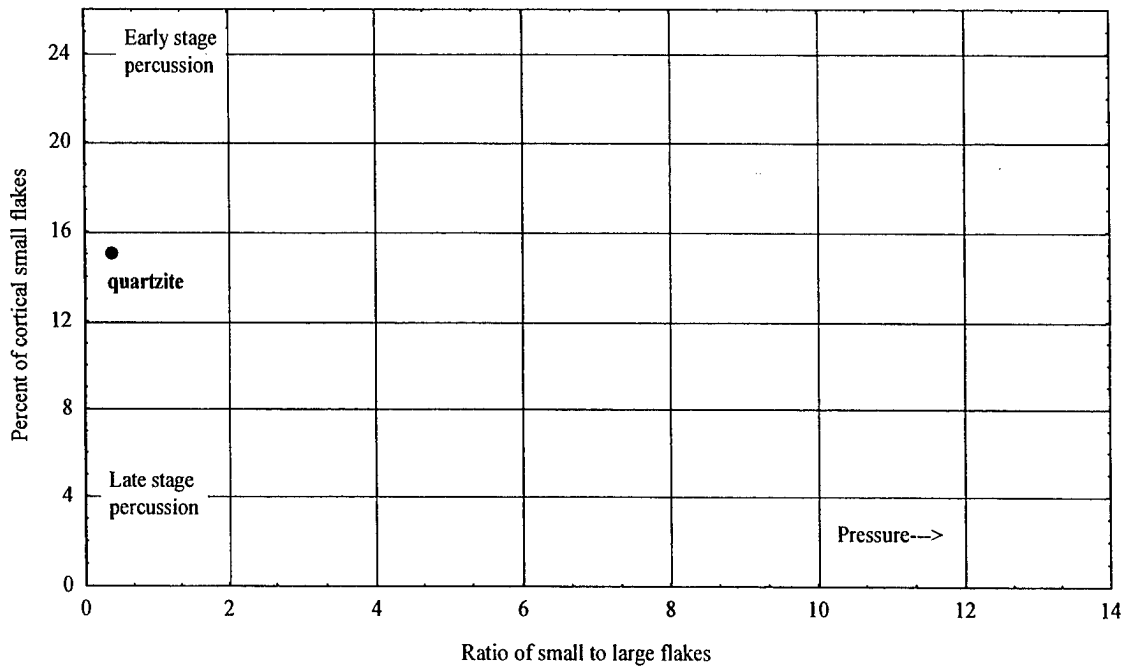


Figure 3.12: Scatter plot of quartzite debitage for 5LA7281.

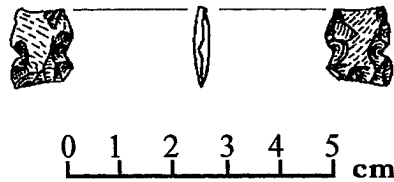


Figure 3.13: Projectile point (5LA7281.0.3) recovered from the surface of 5LA7281.

Two pieces of obsidian were recovered from the surface of the site and submitted for sourcing (Appendix III). One of these pieces (5LA7281.0.8) comes from the Cerro del Medio source locale of the central portion of the Jemez Mountains of New Mexico. The other piece (5LA7281.0.7) comes from a currently unknown locale.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The site is large, with some areas of soil deposition that indicate a high potential for finding intact, buried cultural deposits. Artifact frequency and density are high. The site has two areas of high artifact density and some thermally altered rocks scattered throughout, perhaps indicating localized activity areas. A rim sherd and the side-notched point suggest that the site may yield more data bearing on chronological issues. The presence of obsidian has potential for addressing issues of trade and exchange. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is good potential for locating subsurface cultural deposits should be noted and tested. If such deposits are encountered, then the site should be fenced for protection against potential impact from military activities.

5LA7282

The site is a large lithic scatter located in the western portion of the project area near the top of the ridge that forms the Black Hills (Figures 3.14 and 3.15). The site is located on a west-trending ridge top, and the lithic scatter extends down a south-facing slope of a tributary drainage of Stage Canyon. The lithic scatter covers an area of approximately 3.26 acres. The site datum was set at an elevation of 1,591 m (5,220 ft) asl. The top of the ridge rises approximately 3 m above the datum, and the lowest point on the site is located in the drainage at an elevation of approximately 1,587 m (5,205 ft) asl.

Juniper scrub is the vegetative community in the area around the site. Grama grasses, cholla, and yucca were seen growing on the site. Most of the site has rather shallow soils, but there are some pockets with deposits of at least 15 cm that may be covering intact cultural deposits.

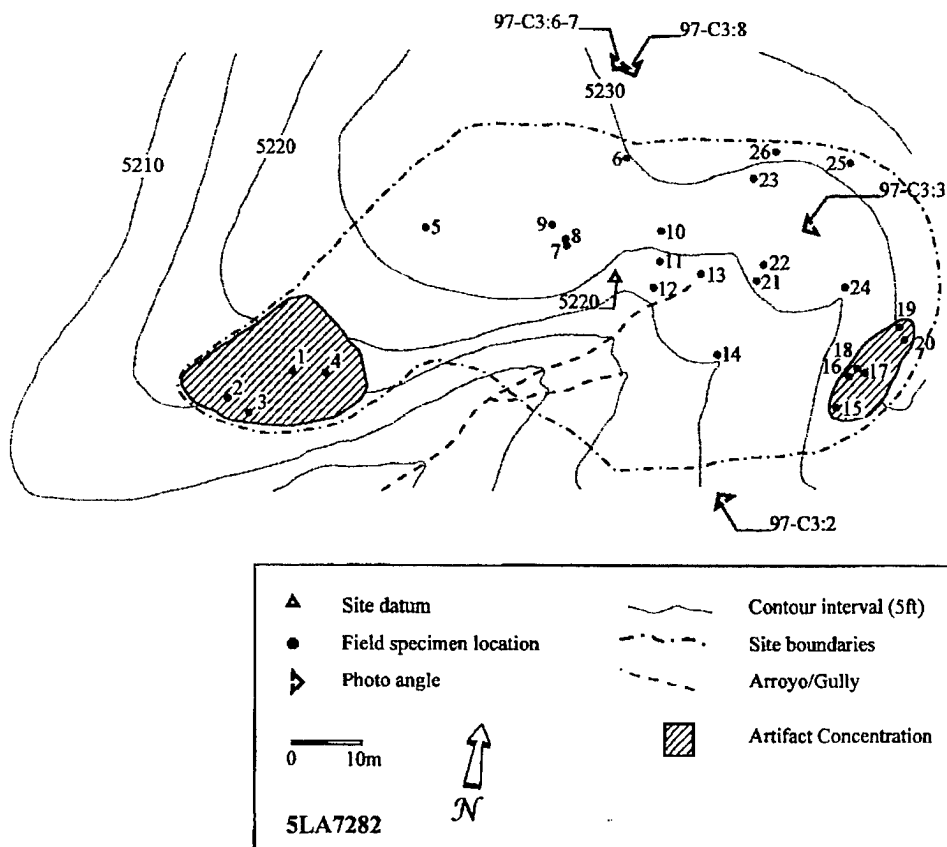


Figure 3.14: Site map, 5LA7282.



Figure 3.15: Overview photograph of site 5LA7282.

Two main artifact concentrations were noted. One is located 40 m and 250 degrees from the site datum and measures approximately 30 x 20 m. The northern edge of the second concentration is located approximately 42 m and 97 degrees from the site datum and measures approximately 17 x 12 m.

Since our intrasite collection strategy was not truly random, the following analytical description may not fully represent the range of variability present at the site. A total of 225 pieces of chipped-stone debitage were recorded from the site (Table 3.5). This represents an unsystematically selected sample of the number of flakes visible on the ground surface at the time the site was recorded. Of the total debitage, 46% is quartzite, 48% is chert, 2% is hornfels/basalt, 1% is argillite, 1% is silicified wood, and there is one piece each of obsidian and quartz. Of the quartzite debitage, 48% falls into the large size grade while 52% is recorded as small; 17% has cortex and 83% of the debitage is noncortical; and 28% is recorded as complex flakes, 3% as shatter, 64% as simple flakes, and 5% as bifacial-thinning flakes. Of the chert debitage 19% is large and 81% is small; 24% is cortical and 76% is noncortical; and 25% is classified as complex, 9% as shatter, 64% as simple, and there was one bifacial-thinning flake and one bipolar core reduction flake.

Figure 3.16 shows a scatter plot of the quartzite and chert debitage. Based on the plot, freehand percussion generated both the quartzite and chert debitage. The plot also suggests that the earlier stages of lithic reduction were responsible for generating most of the chert debitage. This inference is partially supported by the relatively high percentage of shatter (9%) and the presence of a rare bipolar flake. The presence of a chert bifacial-thinning flake also indicates that some working on bifaces may have occurred at the site. The quartzite debitage is characterized by a relatively low percentage of small, cortical flakes (9%), which indicates that the later stages of quartzite lithic reduction may have been a significant activity carried out at the site. The counts for the remaining material types are too small for meaningful analysis.

A single diagnostic projectile point (5LA7282.0.22) was recovered from the surface of the site (Figure 3.16). This specimen is similar to Anderson's (1989) type P27 and is associated with dates that range between 500 B.C. to A.D. 1150. This time range likely suggests an occupation near the end of the Late Archaic (500 B.C. to A.D. 200) or in the Early Ceramic Stage (A.D. 200 to A.D. 800/1000).

Four bifaces, two scrapers, a drill, a utilized flake, a bifacial core-tool, and a non-bipolar core were recovered from the site surface. Of the bifaces, two are complete, and two are fragments. All are fine-grained quartzite. Reduction stages for the bifaces are nearly finished (2), finished (1), and unfinished (1). One broken, nearly finished specimen exhibits light use wear on one lateral edge. Both scrapers are made of chert. The end scraper fragment is nearly finished, and exhibits moderate use wear on the distal end. The complete end and side scraper is nearly finished and shows light use wear on the distal end and one lateral edge. The drill specimen is a bit fragment from a finished tool. Heavy retouch modification and light to moderate use wear is seen on the steep lateral edges. The utilized flake is chert, complete, and displays light use wear on both lateral edges. The bifacial core-tool is coarse-grained quartzite and the non-bipolar core is hornfels/basalt.

Table 3.5: Summary Description of Chipped-stone Debitage for 5LA7282.

	Argillite	Chert	Hornfels/Basalt	Obsidian	Quartz	Quartzite	Silicified Wood
Total flakes	3	108	5	1	1	104	3
Large	0	21	2	0	0	50	1
Small	3	87	3	1	1	54	2
Cortical	0	26	1	0	0	18	0
Noncortical	3	82	4	1	1	86	3
Complex	1	27	0	0	0	29	0
Shatter	0	10	1	0	0	3	1
Simple	2	69	4	1	1	67	2
Bifacial-thinning	0	1	0	0	0	5	0
Bipolar	0	1	0	0	0	0	0

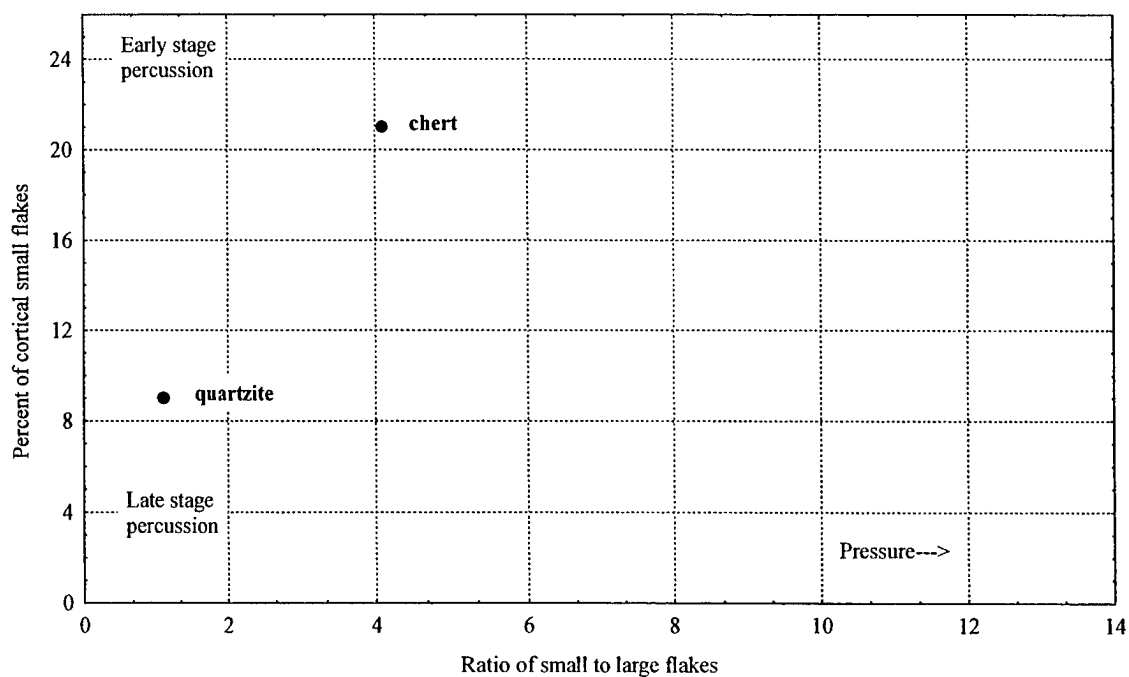


Figure 3.16: Scatter plot of the chert and quartzite debitage for 5LA7282.

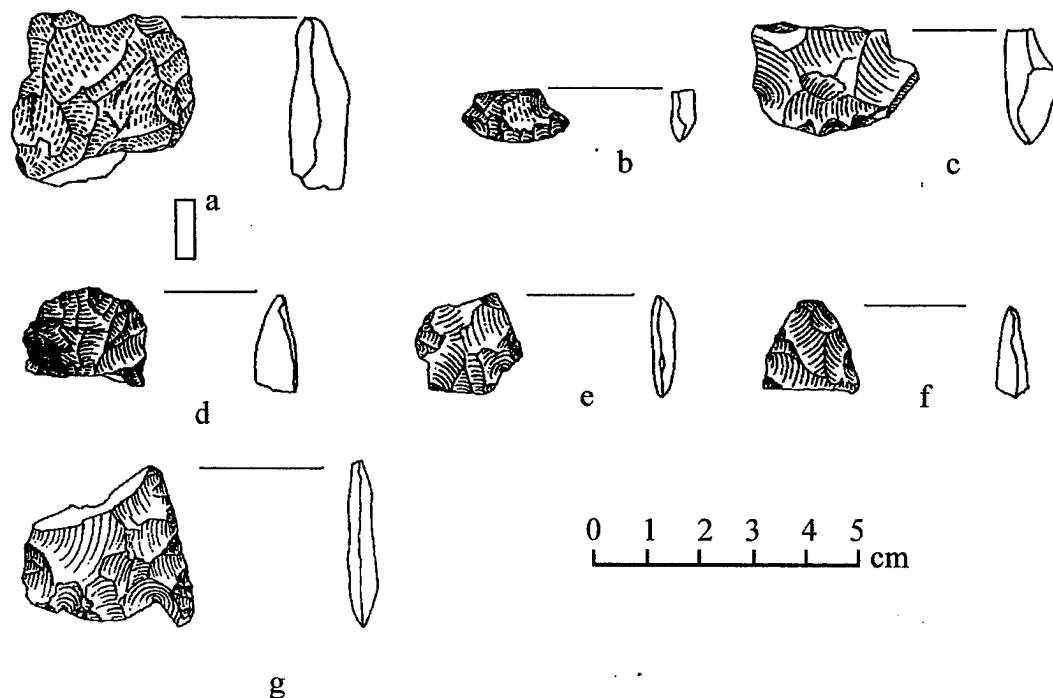


Figure 3.17: Projectile points and bifaces from the surface of 5LA7282: (a) 5LA7282.0.23; (b) 5LA7282.0.24; (c) 5LA7282.0.3; (d) 5LA7282.0.1; (e) 5LA7282.0.10; (f) 5LA7282.0.26; (g) 5LA7282.0.22.

A single piece of obsidian (5LA7282.0.7) was recovered from the surface and submitted for sourcing. It was found to come from the Polvadera Peak source locale of the northern Jemez Mountains of New Mexico (Appendix III).

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The site is large with a high artifact and tool density. The site also exhibits rather deep soil deposition that may indicate the potential for buried, intact, cultural deposits. The presence of potentially diagnostic artifacts indicates that test excavations may yield some useful chronological information. Finally, the presence of obsidian may also be important for reconstructing trade networks. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating subsurface, cultural deposits should be noted and tested. If such deposits are encountered, then the site should be fenced for protection against potential impact from military activities.

5LA7283

The site is a historic homestead/sheepherder's cabin and a sparse, prehistoric lithic scatter (Figure 3.19). It is in the western portion of the project area near the edge of a deep tributary canyon of Stage Canyon. The site and its components extend over an area of approximately 1.4-acres. The site datum is situated at an elevation of approximately 1585 m (5200 ft) asl. There is little topographic relief across the site area, but the canyon edge is located just off the northern and eastern edges of the site.

Juniper scrub is the vegetative community in the area around the site. Besides juniper, rice grass, cholla, bunch grasses, and *Rhus trilobata* were seen growing at the site. Most of the site has rather shallow soils, especially near the canyon edge, where it is badly eroded. However, the areas around the historic structure exhibit deposits of at least 20 cm and may be covering intact, cultural deposits.

The historic component of the site is dominated by a small (15 x 15 ft), unshaped sandstone structure (Feature 1). The foundation of the structure was set in a shallow builder's trench. The walls have collapsed across the interior of the structure, perhaps burying cultural deposits. A depression is located to the north of the structure's masonry foundation and a small pavement of tabular sandstone slabs is located to the east of structure (Feature 2). An associated corral (Feature 3) is also found located 20 m the west of the structure. A fairly diffuse scatter of historic trash is associated with the structure. The trash is comprised of bottle glass and tin cans. Most of the trash is located to the east of the structure with a very sparse scatter of materials to the north. The structure is tentatively dated to between 1910 and 1930 based, in part, on the presence of amethyst glass. This period of time corresponds to the socio-political period of Early Ranching (1910-1930).

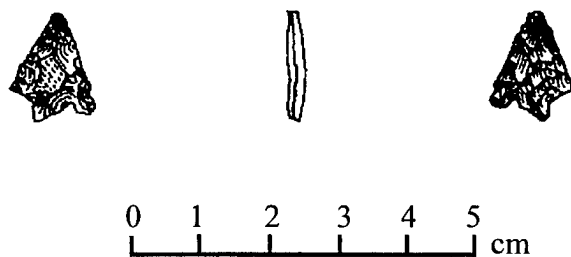


Figure 3.18: Projectile point (5LA7283.0.2) recovered from the surface of 5LA7283.

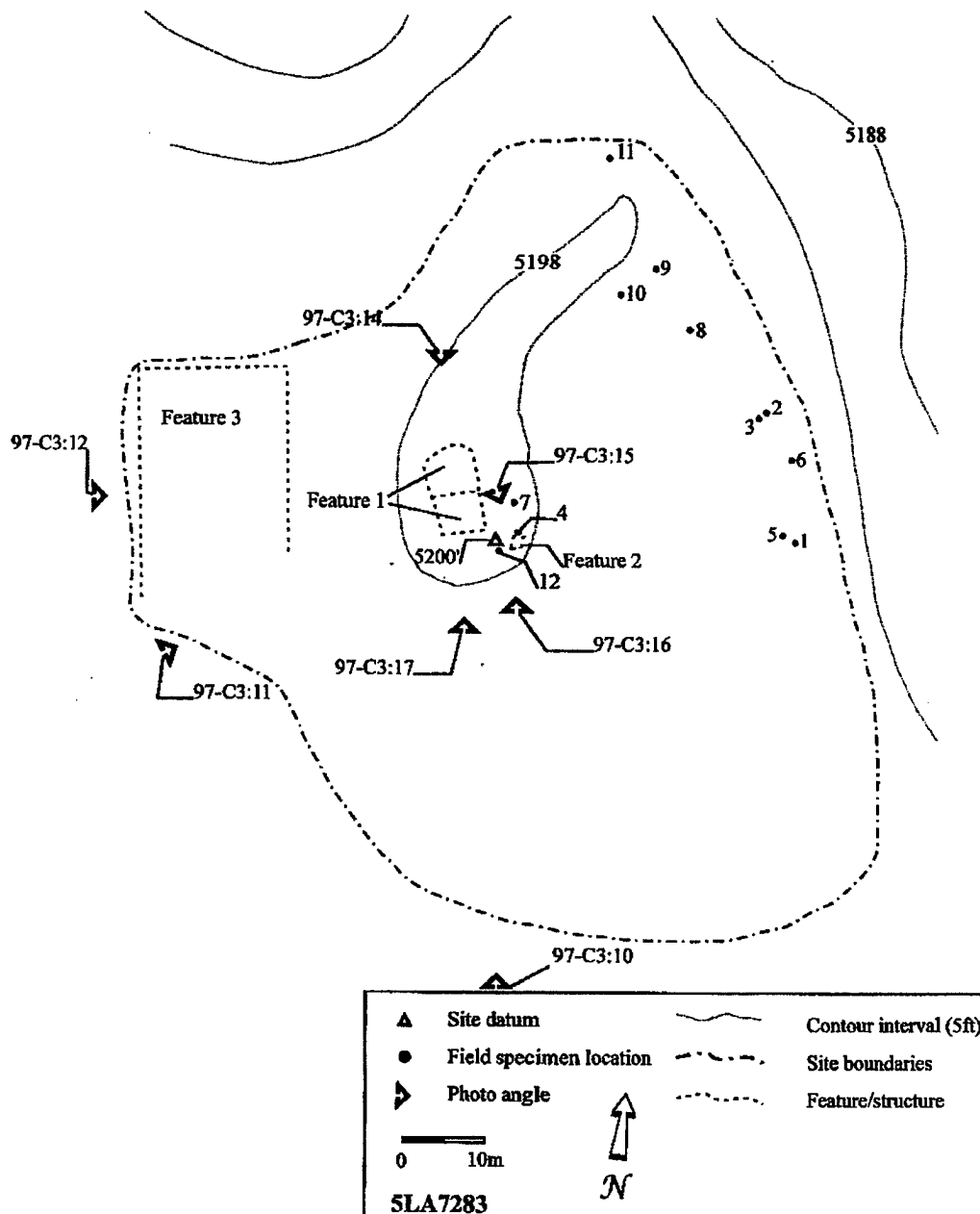


Figure 3.19: Site map, 5LA7283.

The prehistoric component of the site is comprised of a sparse lithic scatter in the immediate vicinity of the historic structure. Only 59 pieces of chipped-stone debitage were recorded at the site. The stone-tool assemblage consists of three unfinished bifaces, a drill bit fragment, and a complete side scraper. A single piece of ground stone (FS 12), a mano, was found resting on the surface off the southeast corner of Feature 1. This piece may be a historic artifact or a prehistoric artifact reused in the construction of the historic structure. A small, corner-notched, chert projectile point (5LA7283.0.2) was recovered from the surface of the site. This specimen resembles Anderson's (1989) P62 type and has associated dates that range from between A.D. 500 to A.D. 1400 (Figure 3.18). The occupation of the prehistoric component of the site was likely during the Middle Ceramic Stage (A.D. 800/1000 to A.D. 1500).

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of history (Criteria D). Only the historic component of the site and particularly Feature 1 should be considered eligible for the National Register. The wall fall of Feature 1 may have sealed and protected intact, cultural deposits beneath the surface. We suggest that the site be fenced for its protection and revisited for more detailed mapping and surface collection. Test units should be excavated in Feature 1 to determine if subsurface, cultural deposits are present.

5LA7303

The site is a large lithic scatter at the head of a north south ranging tributary canyon of Stage Canyon. The 8.8-acre site extends across three drainages and the small ridges separating them (Figures 3.20 and 3.21). The western most drainage is badly eroded, especially at its head, and site materials extend down onto the weathered sandstone ledges and to a seep area to the east. Artifact density was generally variable with the high-density areas in the southeast and central portions of the site. The site datum is at approximately 1555 m (5100 ft) asl with the lowest portions of the site situated in the drainages at an elevation of approximately 1550 m (5085 ft) asl. A low bedrock ledge located along the eastern margin of the site, rises to an elevation of approximately 1562 m (5123 ft) asl.

Located in a vegetative community dominated by juniper, the on-site vegetation also includes *Opuntias*, mountain mahogany, ricegrass, and the grama grasses. The vegetation in the seep area is more varied with maidenhair fern, poison ivy, and choke cherry. Soils are relatively shallow (up to ca. 20 cm) and erosion has exposed bedrock in the drainage bottoms, however, there may be intact deposits in the area adjacent to the low bedrock ledge in the east.

One concentration of ash and fire cracked rock was noted in the southeastern portion of the site (Feature 1). An eroded panel of petroglyphs was also noted at approximately 15 m and 315 degrees from the site datum. It includes a possible anthropomorph and a possible quadruped, but it is badly exfoliated and nearly destroyed (Figures 3.22 and 3.23). The petroglyph style is consistent with a Late Archaic time period (1000 B.C. to A.D. 200).

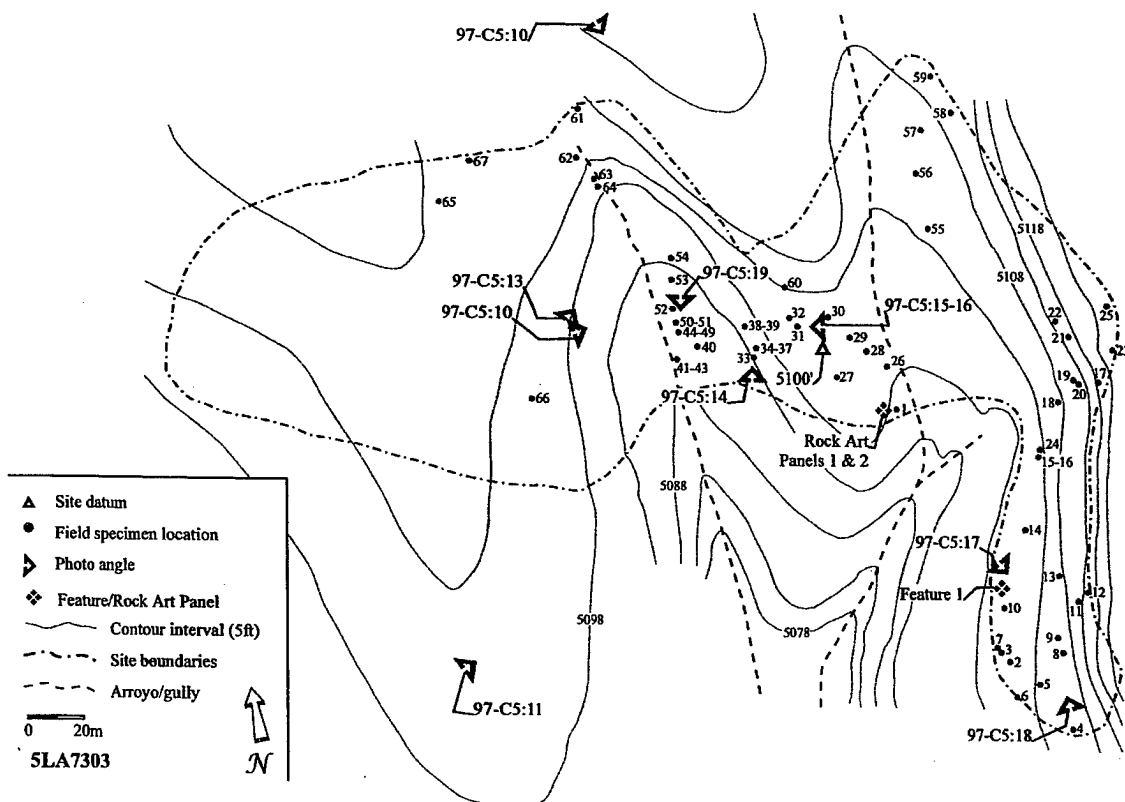


Figure 3.20: Site map, 5LA7303.

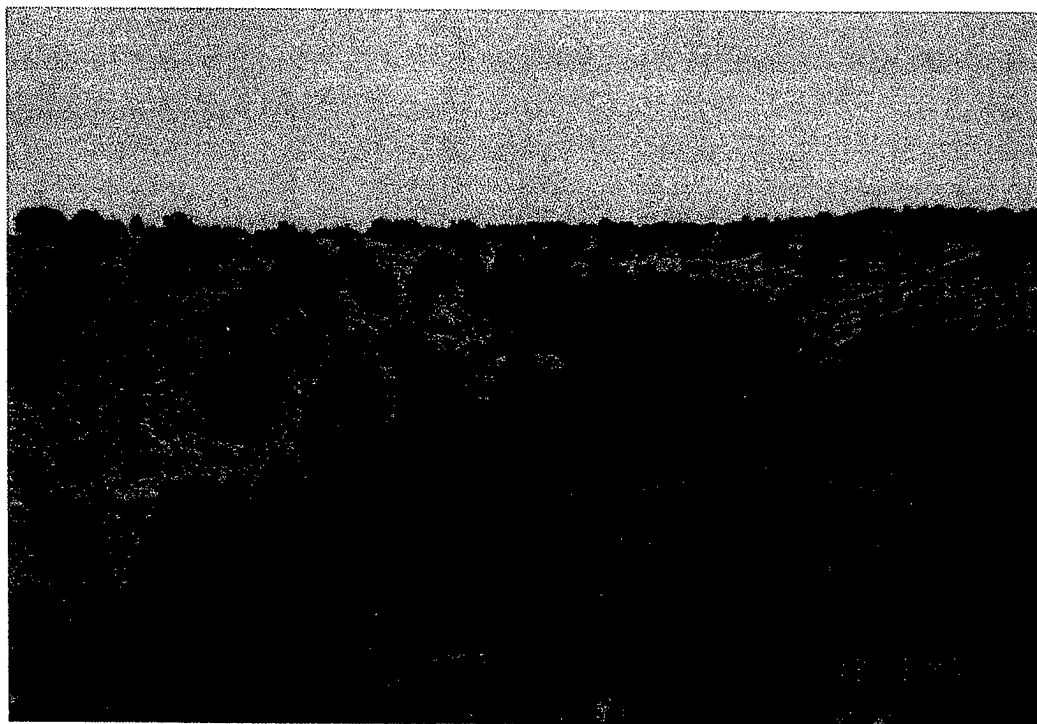


Figure 3.21: Photograph of site 5LA7303 taken facing 130° from north boundary.

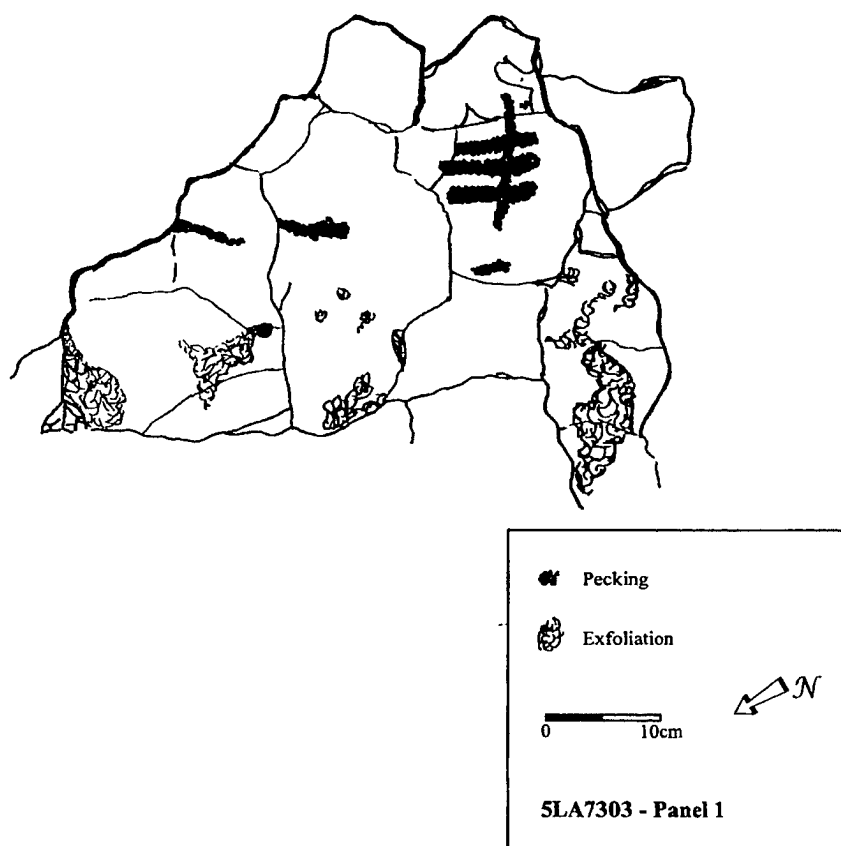


Figure 3.22: Petroglyph panel 1, 5LA7303.

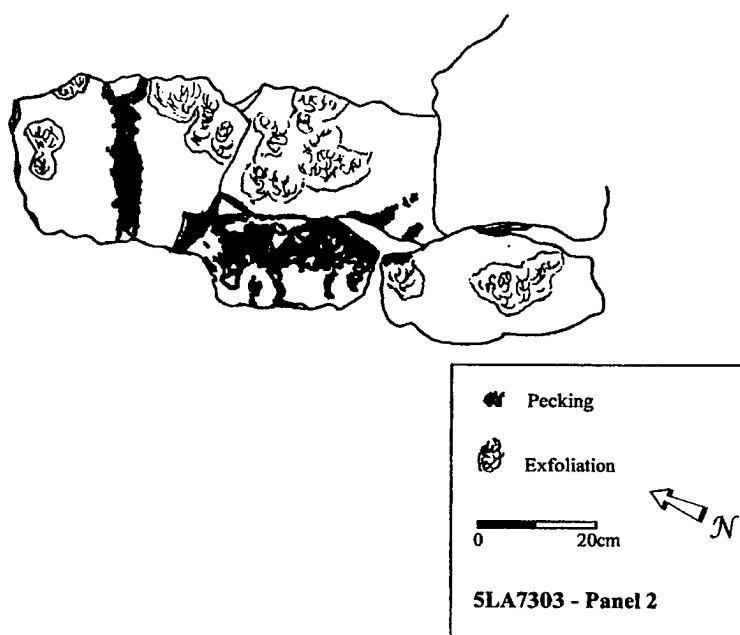


Figure 3.23: Petroglyph panel 2, 5LA7303.

The intrasite collection strategy was not truly random, and the following analytical description may not fully represent the range of variability present at the site. A total of 161 pieces of chipped-stone debitage were recorded at the site (Table 3.6). This total represents a sample of the visible flakes on the ground surface at the time the site was recorded. Six material types were noted. Of the debitage, 68% is quartzite, 17% is chert, 9% is hornfels/basalt, 3% is argillite, 2% is quartz, and 1% is limestone. Of the quartzite debitage, 68% is the large size grade and 32% is small; 35% of the debitage has cortex and 65% is noncortical; and 35% is recorded as complex flakes, 4% as shatter, 60% as simple flakes, and 1% as bifacial-thinning flakes. Of the chert debitage, 44% is large and 56% is small; 26% is cortical and 74% is noncortical; and 56% are complex flakes, 22% are shatter, and 22% are simple flakes.

Figure 3.24 shows a scatter plot of both quartzite and chert and indicates that complex and mixed lithic reduction strategies were employed at the site. It appears that freehand percussion generated the quartzite debitage. A quartzite bifacial-thinning flake indicates that some biface reduction was carried out at the site. The quartzite debitage plots out slightly lower than the average for all sites recorded in the 1997 survey, suggesting late-stage reduction strategies were carried out at the site. The relatively high count of large chert flakes suggests that early-stage, freehand percussion was responsible for generating the chert debitage. Artifact counts for the remaining material types are too low for meaningful analysis.

Four diagnostic projectile points were recovered from the surface of the site (Figure 3.25). Two of these are relatively early (5LA7303.0.19 and 5LA7303.0.3) and have dates that extend into the Early Archaic stage (5500 B.C. to 3000 B.C.). These two are similar to Anderson's (1989) P10 type. A third projectile point (5LA7303.0.2) resembles Anderson's (1989) P9 type, which has a wide temporal range from 3300 B.C. to A.D. 1000. The final specimen (5LA7303.0.1) falls into Anderson's (1989) P26 type, which has a temporal range from 1000 B.C. to A.D. 500. Based on these artifacts, it seems likely that the site had an Early Archaic occupation (5500 B.C. to 3000 B.C.). Another occupation during the Middle Archaic (3000 B.C. to 1000 B.C.) is also a possibility, but a Late Archaic occupation (1000 B.C. to A.D. 200) seems more likely. This latter suggestion is consistent with the age of the petroglyphs.

The stone-tool assemblage consists of 22 artifacts, of which eight are bifaces, five are non-bipolar cores, four are bifacial core-tools, three are scrapers, one is a retouched uniface tool, and one is a utilized flake. Material types for the cores are chert (3) and coarse-grained quartzite (2). Three of the four bifacial core-tools are coarse-grained quartzite and one is argillite.

Of the bifaces, half (4) are broken. Four are made of coarse-grained quartzite, three are fine-grained quartzite, and one is hornfels/basalt. Five of the eight specimens are unfinished, and three are nearly finished. All show distinct bifacial modification with no apparent use wear along the edges. All of the scrapers are finished and complete. The two end/side scrapers are made of chert and fine-grained quartzite. Both exhibit light to moderate use wear on one lateral edge and the distal end. The side scraper is coarse-grained quartzite and shows moderate use wear on the right lateral edge. The uniface tool is finished, complete, and made of argillite. Retouch modification is seen on one face and moderate use wear is noted along the right lateral edge. The complete, utilized flake specimen is made from siltstone. Both acute lateral edges show light use wear, which suggests cutting activity.

Table 3.6: Summary Description of Chipped-stone Debitage for 5LA7303.

	Argillite	Chert	Hornfels/Basalt	Limestone	Quartz	Quartzite
Total flakes	5	27	14	2	3	110
Large	3	12	7	2	3	75
Small	2	15	7	0	0	35
Cortical	1	7	6	1	1	38
Noncortical	4	20	8	1	2	72
Complex	3	15	4	2	2	39
Shatter	0	6	0	0	0	4
Simple	2	6	10	0	1	66
Bifacial-thinning	0	0	0	0	0	1
Bipolar	0	0	0	0	0	0

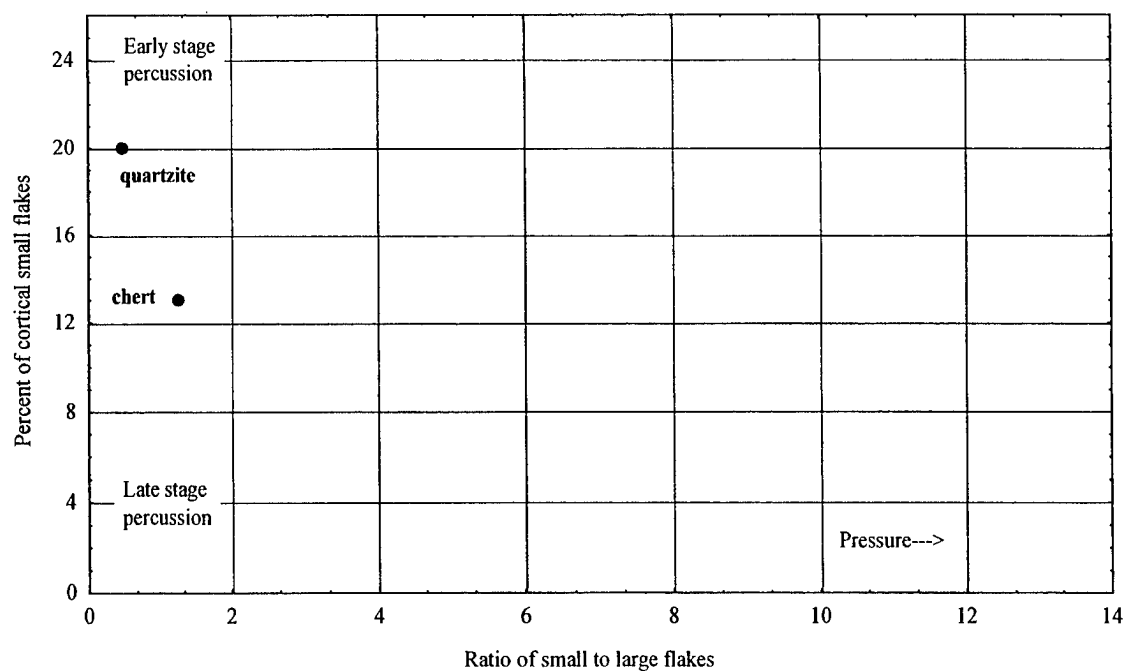


Figure 3.24: Scatter plot of chert and quartzite debitage for 5LA7303.

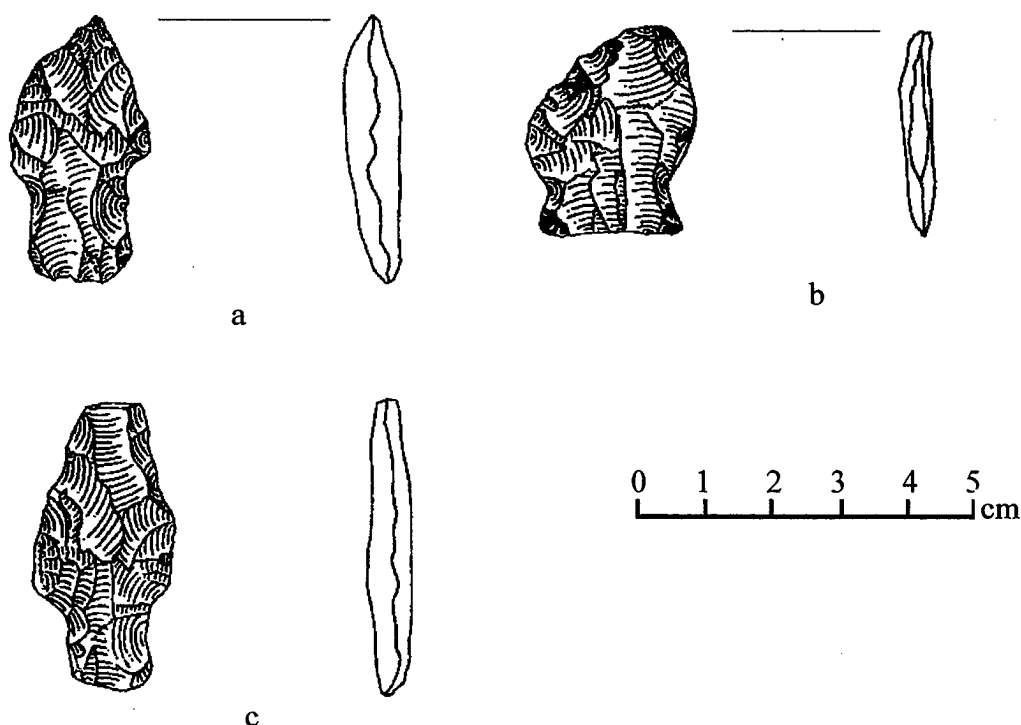


Figure 3.25: Projectile points from the surface of 5LA7303: (a) 5LA7303.0.2; (b) 5LA7303.0.1; (c) 5LA7303.0.3.

A total of 36 pieces of ground stone were recorded at the site. Site 5LA7303 had a greater quantity of ground stone than any other site recorded in the 1997 Black Hills reconnaissance. Of the total, 19 are manos, 16 are metates, and one is an edge-ground cobble. Several of these pieces of ground stone were found in the eroded, eastern drainage. Of particular interest is a metate (FS 33) that is balanced on a resistant column of sandstone along the exposed bedrock ledges of the drainage. This particular specimen is a shallow basin metate with an oval grinding surface with evidence of pecking and grinding. It is made of quartzite, and longitudinal striations are visible.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The site is large, with a high artifact and tool density. Although there is little deposition along the drainage area of the site, more substantial deposits are present near the eastern margin of the site. Several temporally diagnostic artifacts and possible thermal features indicate a likelihood of encountering data pertinent to chronological issues. The chronological remains recovered from the surface of the site suggest that the site has an early occupation, perhaps extending into the Early Archaic (5500 B.C. to 3000 B.C.). This time period is poorly understood and represented by only a few sites at the PCMS. Test excavations may yield important data that could augment our understanding of this early time period. The potential for buried thermal features and the abundance of ground stone may also indicate the presence of pollen, faunal, and macrobotanical remains useful in reconstructing subsistence patterns and the paleoenvironment. The presence of an Alibates chert projectile point also suggests that data may

be forthcoming that can be used to address issues regarding trade and exchange. Finally, the presence of two rock art panels is data relevant to the study of ideology and cosmological issues. The site was fenced for its protection shortly after its discovery; however, we suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating subsurface cultural deposits should be noted and tested to determine their presence or absence.

5LA7307

This site is a large lithic scatter and structure site located at the western edge of a large 'boot-shaped' ridge that overlooks Stage Canyon (Figure 3.26). The 5-acre site is on the ridge top, but also extends into a narrow arroyo southeast of the site datum. The structures recorded at the site are confined to the top of the ridge, and only chipped-stone debitage and stone tools are located in the arroyo bottom. The site datum was placed at approximately 1,579 m (5180 ft) asl with the lowest portions of the site situated in the arroyo bottom at an elevation of approximately 1,563 m (5,128 ft) asl.

The site is located in the juniper scrub vegetative community typical of the Black Hills. Juniper, ricegrass, bunch grass, grama grasses, the *Opuntias*, and mountain mahogany were seen growing on the site. Soils are relatively thin, especially on the ridge top; however, areas of slightly more deposition are noted in one of the structures (Feature 1) and in the hollow on the eastern margin of the site.

Six features were recorded at the site, one of which (Feature 1) is a sandstone slab, circular structure located near the top of a slight rise in the center of the ridge top. This structure is the best preserved and most clearly distinguishable of the features at the site. It is constructed of sandstone slabs in a circular arrangement that measures approximately 4.8 m in diameter (Figure 3.27). A second, less obvious, room may be attached to the eastern edge of the structure and is indicated in the illustration only by a light cluster of rocks. A considerable amount of animal burrowing has churned up the soil inside the structure and has likely disturbed a good deal of the deposits. The main unit of the feature conforms to Kalasz's (1989) Class VI, which is a freestanding, full-enclosure, agglutinated unit with continuous rock walls. Kalasz (1989:105) indicated that an obsidian hydration date of A.D. 1275 \pm 130 B.P. is associated with one such structure. According to Kalasz (1989:108), other Class VI structures have associated radiocarbon dates that extend from the Early-to-Middle Ceramic stage (A.D. 200 to A.D. 1500). If this date can be reliably used to cross-date Feature 1, then we can infer an occupation of the site at some time during the Early Ceramic Stage (A.D. 200 to A.D. 800/1000).

Features 2 and 3 are alignments of sandstone slabs (Figures 3.28 and 3.30). Feature 2 measures approximately 5 x 4 m and Feature 3 measures approximately 6.5 x 1.5 m. No distinct forms can be discerned from the alignments and it is difficult to determine if these features are simply rock alignments, or the remains of badly eroded structures. These features are also located just outside Kalasz's (1989:91) 12 m criterion that would type them as cliff edge alignments. Feature 4 is a small pile of sandstone slabs located southwest of the site datum. Approximately 4-5 slabs are piled on an eroded bedrock boulder overlooking the canyon below.

Feature 5 is possibly a wall made of sandstone slabs measuring 12 x 3 m (Figure 3.29). It fits within Kalasz's classification of a freestanding stone alignment. It, too, is just outside the 12-m criterion that would place it in the cliff edge alignment type. It is situated along the southern end of the site, about 15 m from the cliff edge. The area around the feature is badly eroded, and little soil deposition is noted. Feature 6 is a small stone cairn located in the central part of the site on a small bench near the slopes leading to the arroyo. Three quartzite non-bipolar cores were found in the immediate vicinity of the stone feature.

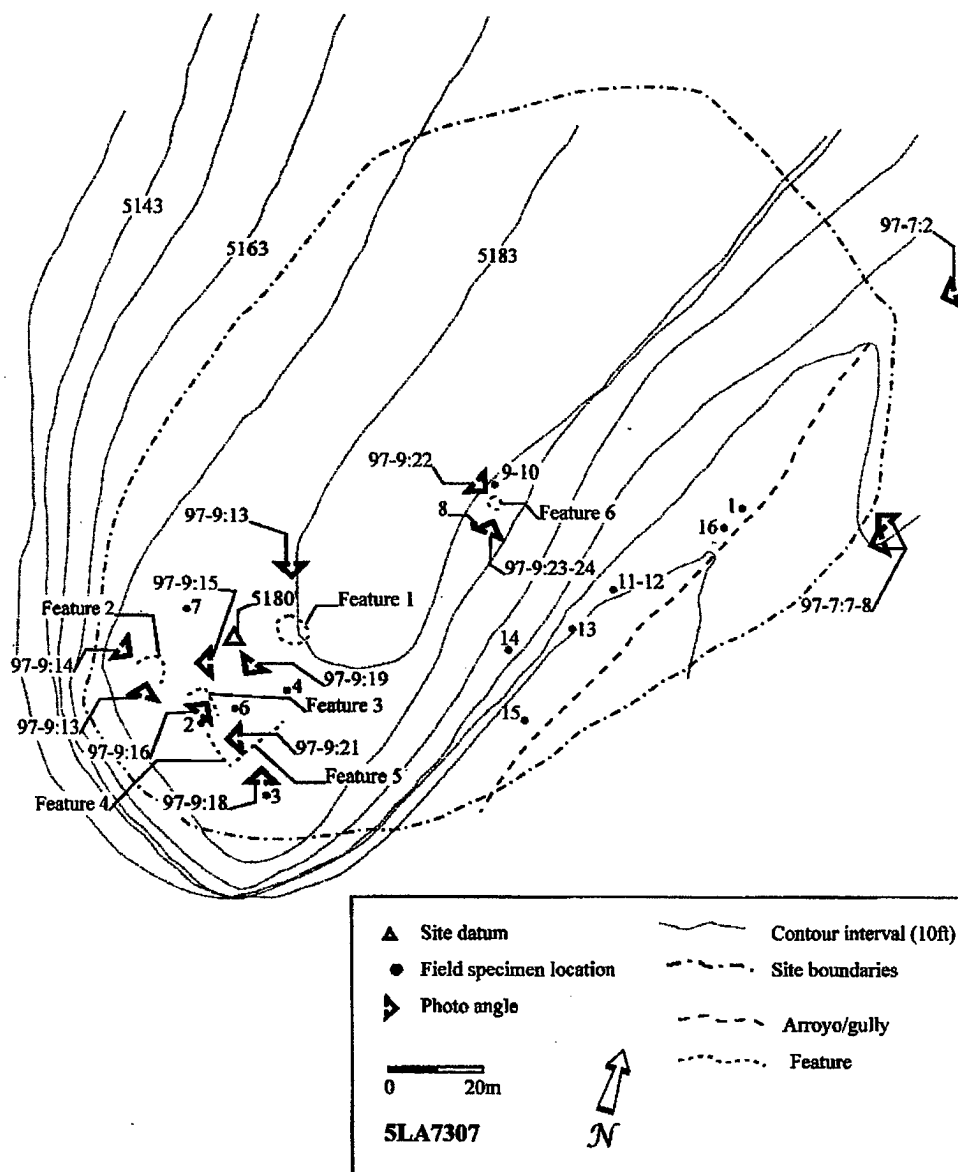


Figure 3.26: Site map, 5LA7307.

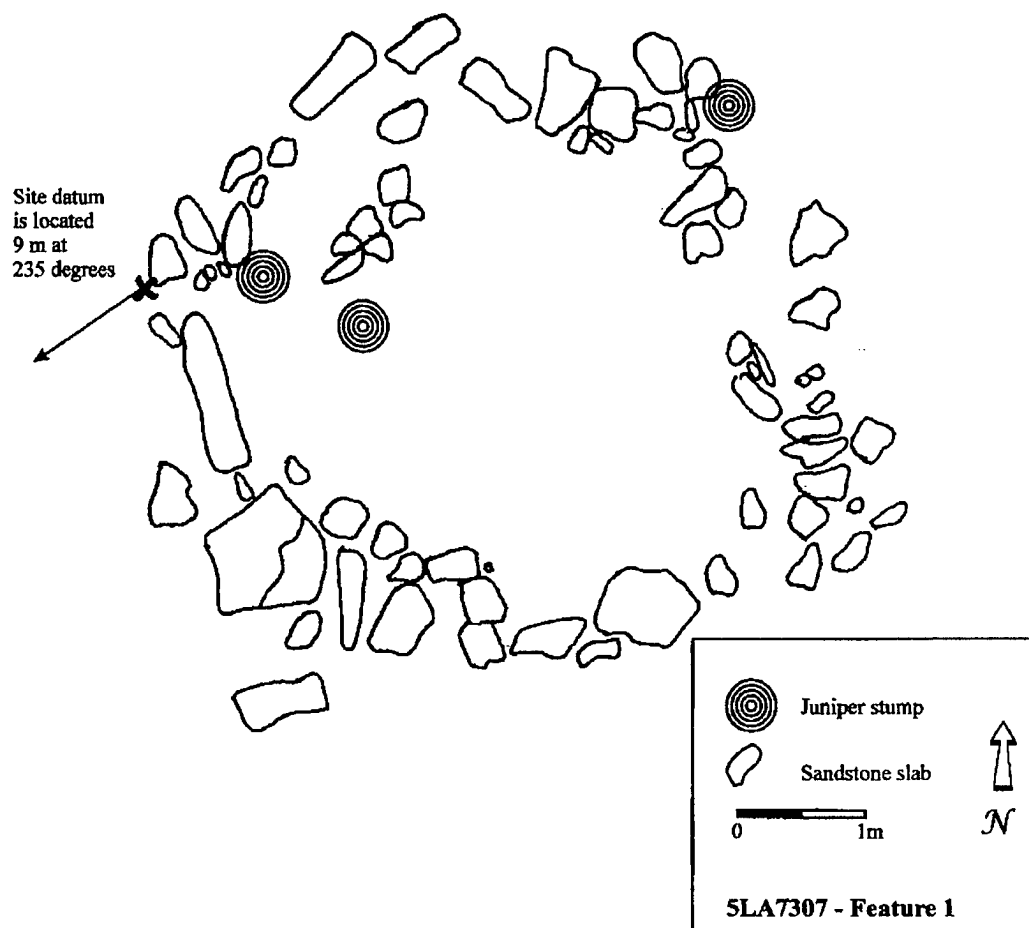


Figure 3.27: Planview, Feature 1, 5LA7307.

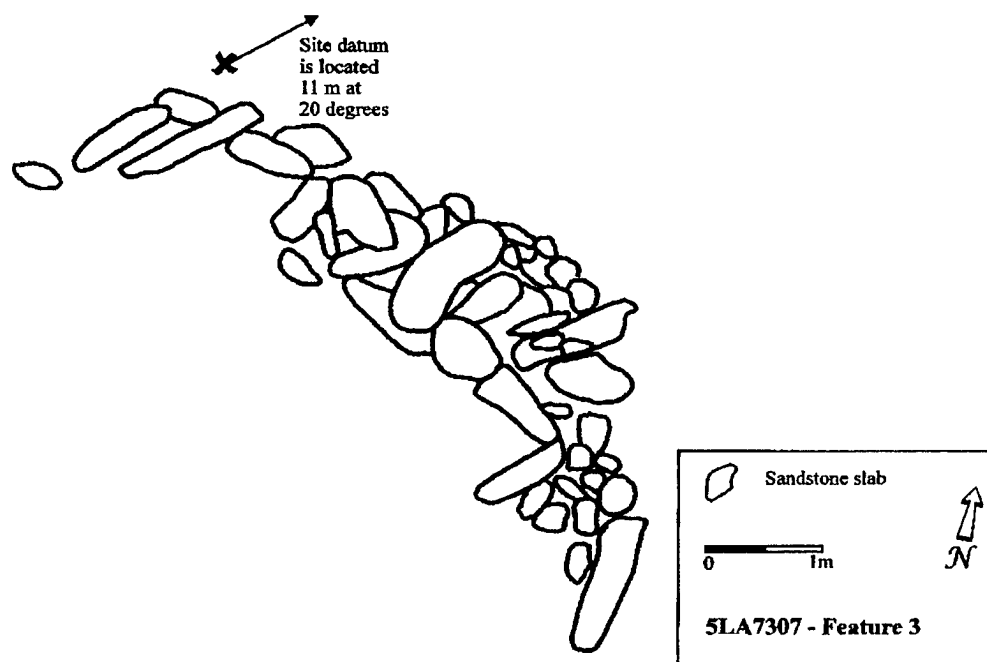


Figure 3.28: Planview, Feature 3, 5LA7307.

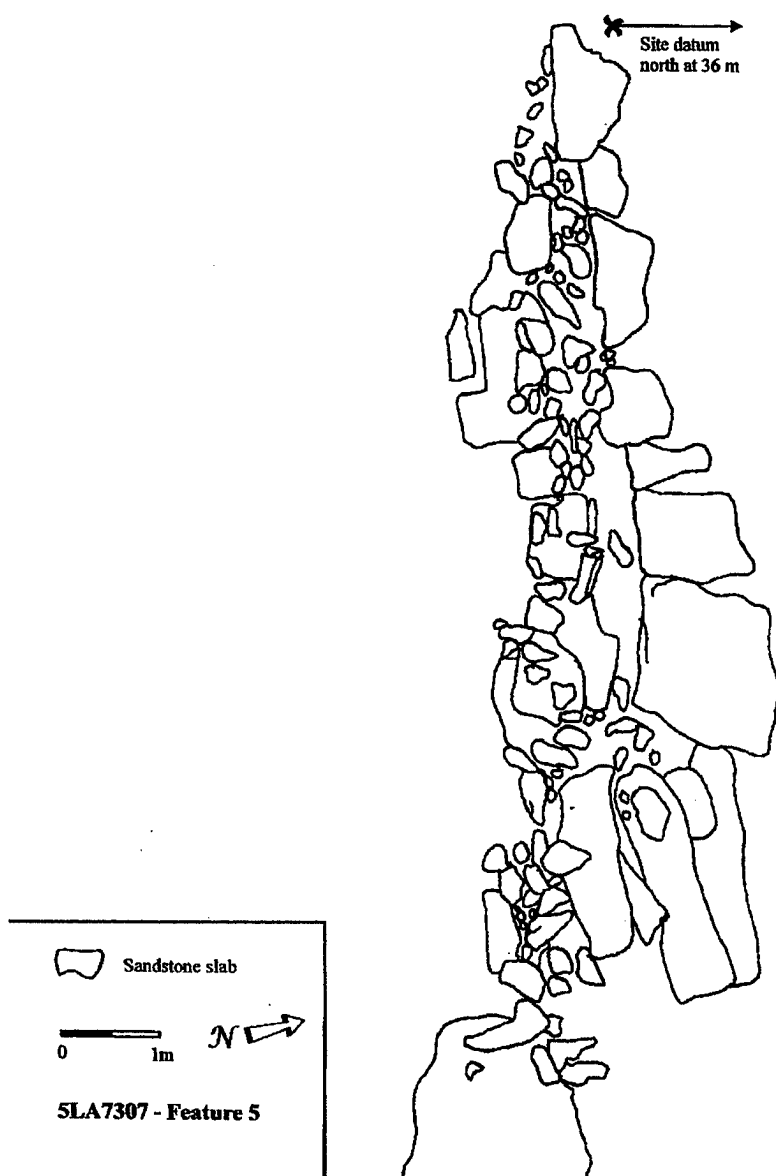


Figure 3.29: Planview, Feature 5, 5LA7307.

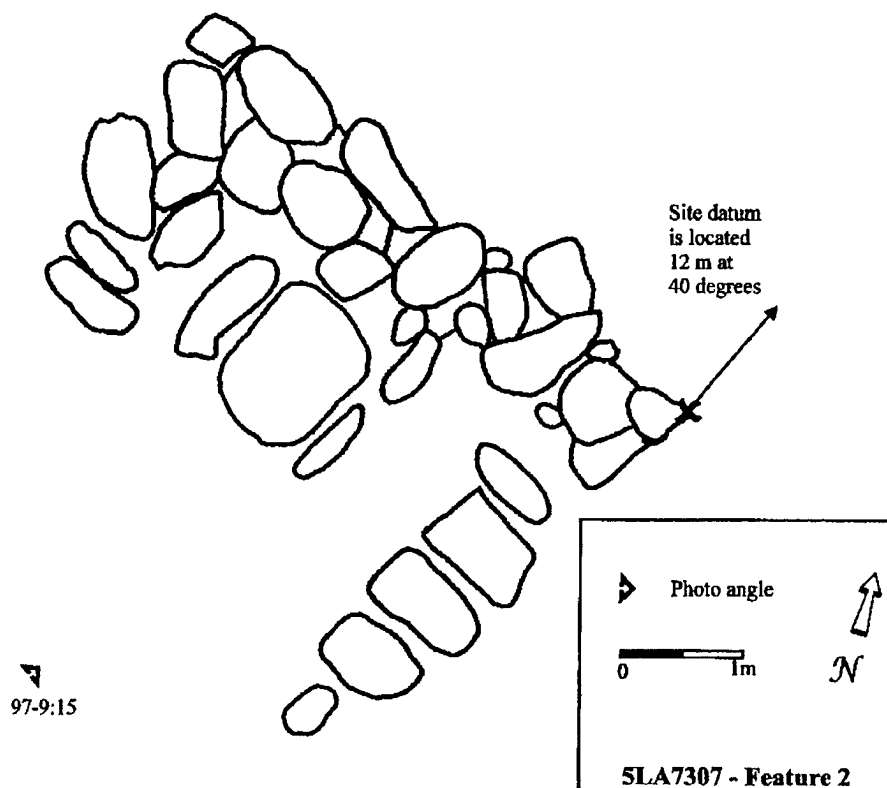


Figure 3.30: Planview, Feature 2, 5LA7307.

The intrasite collection strategy was not truly random, and the following analytical description may not represent the range of variability at the site. A total of 168 pieces of chipped-stone debitage were recorded from the site (Table 3.7). This total represents an unsystematically selected sample of the flakes seen on the ground surface of the site. Only three material types were noted, and a single flake represents the obsidian. Of the total debitage, 91% is quartzite, 8% is chert, and 1% is obsidian. Of the quartzite debitage, 71% falls into the large size grade while 29% is recorded as small; 15% of the debitage has cortex and 85% is noncortical; and 25% is recorded as complex flakes, 10% as shatter, 65% as simple flakes, and one as a bifacial-thinning flakes. Of the chert debitage, 36% is large and 64% is small; 7% is cortical and 93% is noncortical; and 21% is classified as complex flakes, 21% as shatter, 50% as simple, and there is one bifacial-thinning flake.

Figure 3.31 shows a scatter plot of the quartzite debitage for the entire site. Freehand percussion was used to generate the quartzite chipped-stone debitage. The relative paucity of quartzite cortical, small flakes suggests late-stage reduction as tool manufacture/maintenance. This is supported by the presence of a quartzite bifacial-thinning flake. The frequencies of chert are low (14); however, the complete lack of cortical small flakes and the presence of a bifacial-thinning flake suggest that late-stage lithic reduction generated the chert debitage.

Table 3.7: Summary Description of Chipped-stone Debitage for 5LA7307.

	Chert	Obsidian	Quartzite
Total flakes	14	1	153
Large	5	0	109
Small	9	1	44
Cortical	1	0	23
Noncortical	13	1	130
Complex	3	0	38
Shatter	3	0	15
Simple	7	1	99
Bifacial-thinning	1	0	1
Bipolar	0	0	0

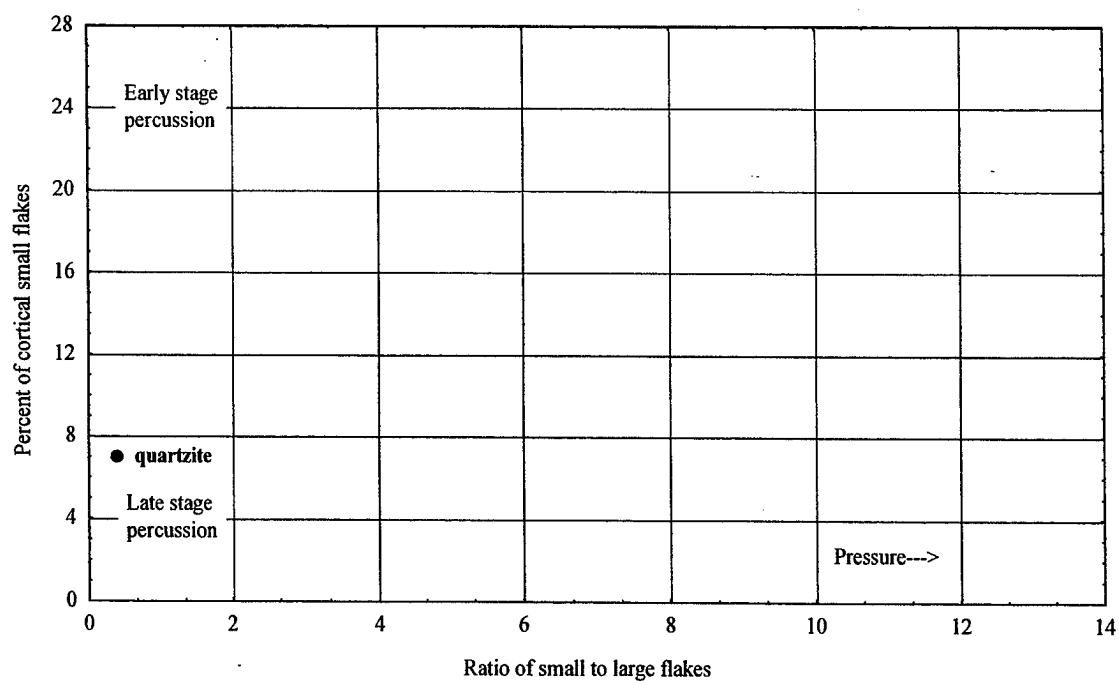


Figure 3.31: Scatter plot of the all the quartzite debitage from 5LA7307.

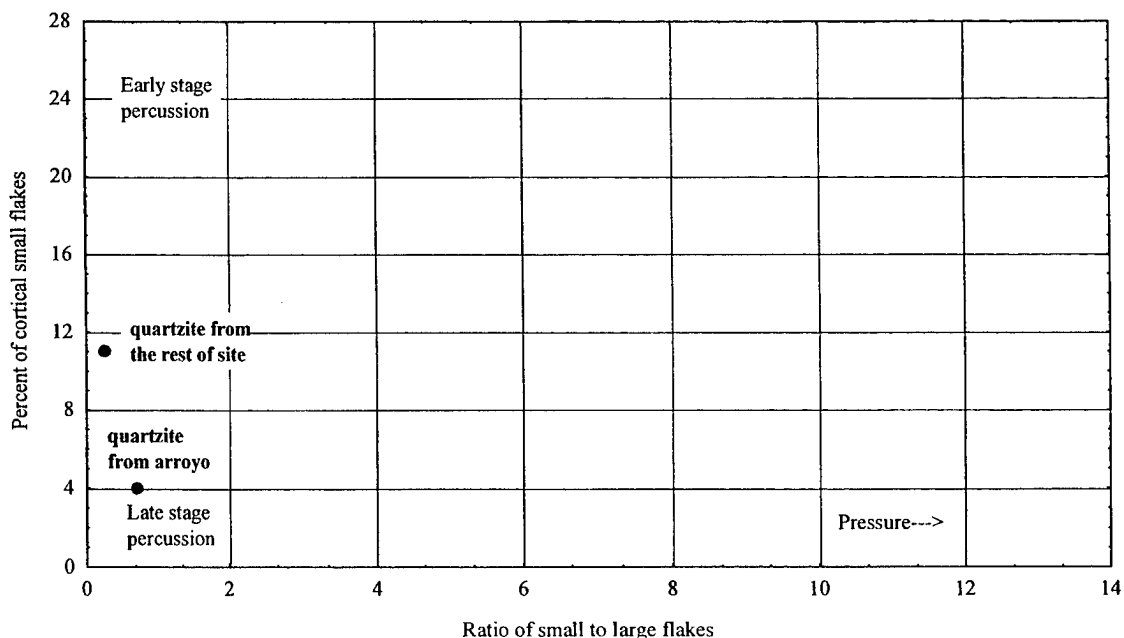


Figure 3.32: Scatter plot of quartzite debitage from arroyo bottom and rest of site for 5LA7307.

The debitage recorded from the arroyo on the eastern margin of the site seems to suggest an even stronger pattern of tool manufacture/maintenance than the quartzite debitage for the site as a whole (Figure 3.32). Two bifacial-thinning flakes (one of chert and one of quartzite) both come from the arroyo. In contrast, it appears that some quartzite early-stage lithic reduction or core reduction occurred in and around Feature 6. Three quartzite non-bipolar cores were found within a few meters of this feature; and 10 of the 12 quartzite flakes found along the slopes near this feature are large, yielding a 1:5 small-to-large flake ratio.

No temporally diagnostic materials, such as projectile points or ceramics, were recovered. The structures indicate occupation during the Early Ceramic stage (A.D. 200 to A.D. 800/1000).

A single piece of obsidian (5LA7307.0.1) was collected from the upper part of the arroyo and was determined, through source analysis, to come from Polvadera Peak in the northern portion of the Jemez Mountains of New Mexico (Appendix III).

Twelve artifacts from the site assemblage are classified as tools. Of these, four are non-bipolar cores, two are large core-tools, two are bifaces, two are utilized flakes, one is an end/side scraper, and one is a retouched uniface tool. The cores and core-tools are quartzite. Both biface tools are broken. The quartzite specimen is unfinished and exhibits no visible use wear. The finished chert biface shows light use wear on the remaining lateral edge, which is acute in edgeview. Both utilized flakes are fine-grained quartzite and show light to moderate use wear on the lateral edges. The end/side scraper is broken and made of chert. Retouch modification and light to heavy use wear is seen on both lateral edges and the distal end. The uniface tool is broken and made of quartzite. This unfinished tool exhibits moderate scraping usage on the left lateral edge.

Three pieces of ground stone were recorded at the site. They include a slab metate with a flat grinding surface and made of sandstone, an oval-shaped mano made of quartzite, and an oval-shaped mano made of sandstone. All of these tools are broken.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Although there is little deposition on the ridge top, substantial deposits are present in the arroyo along the eastern margin of the site and in Feature 1. The presence of structures and the site's location in an isolated position on the point of a ridge is precisely the sort of location where many Early Ceramic and Middle Ceramic villages are found. The site may be useful for addressing questions concerning settlement patterns. The debitage analysis suggests that fairly discrete activity areas could be found that might aid in understanding the site function. The potential for buried thermal features in or around the structures and the presence of ground stone also indicates the likelihood that pollen, faunal, and macrobotanical remains useful in reconstructing subsistence patterns and paleoenvironment will be recovered through excavation. The presence of a piece of obsidian from the Polvadera Peak geochemical source area of the Jemez Mountains suggests that data may be forthcoming to address issues regarding trade and exchange. The site was fenced for its protection shortly after its discovery; however, we suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating subsurface cultural deposits should be noted and tested to determine their presence or absence.

5LA7310

The site is a large lithic scatter and structure site located in the western portion of the project area. It is situated on the north side of a large drainage cutting across the western slopes that rise from the plains to form the ridge of the Black Hills. The 11.2-acre site extends from the edge of a low canyon to a terrace just above the drainage bottom (Figures 3.33 and 3.34). The site datum is at approximately 1,579 m (5,180 ft) asl with the lowest portions of the site situated in the arroyo bottom 12-15 m below.

The site is located in the juniper scrub vegetative community typical of the Black Hills. Juniper, mountain mahogany and grama grasses were seen growing on the site. Soils are relatively thin, especially on the ridge top where exposed bedrock was common; however, areas of up to 15 cm of deposition were noted.

Two sandstone slab structures were recorded at the site (Features 1, and 2). Feature 1 (Figure 3.36) is a circular structure that measures approximately 4 m in diameter and is located about 18 m southwest of the site datum. Several upright slabs were noted along the southern wall. This structure most closely resembles Kalasz's (1989) Class V, Category 17, which is a contiguous wall, rock abutment, fully enclosed, isolated unit. Kalasz (1989:103) indicates that similar stone structures from Carrizo Ranch have associated radiocarbon dates of 930 ± 225 B.P. and 630 ± 50 B.P. If these dates can be reliably used to cross-date Feature 1, then we can infer an occupation of the site at sometime during the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

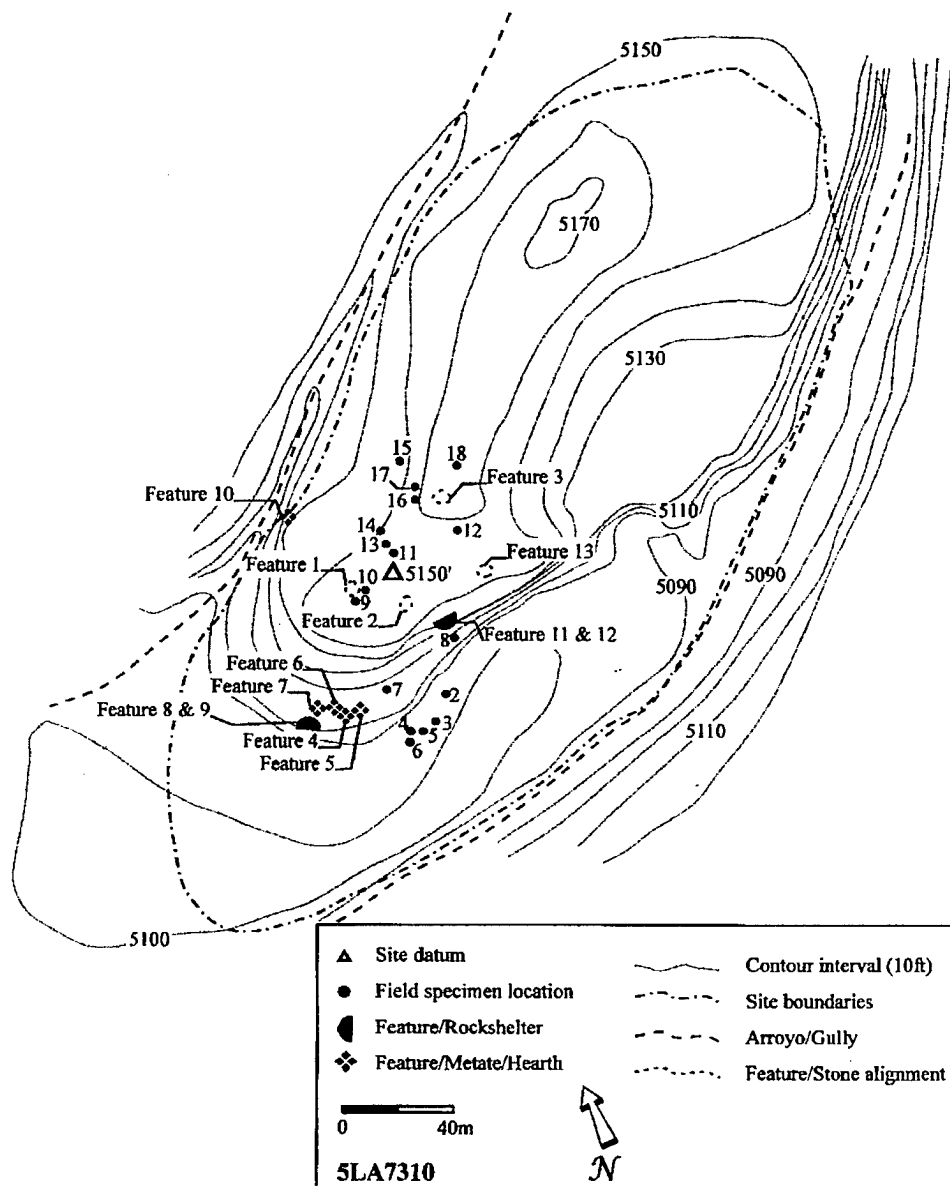


Figure 3.33: Site map, 5LA7310.

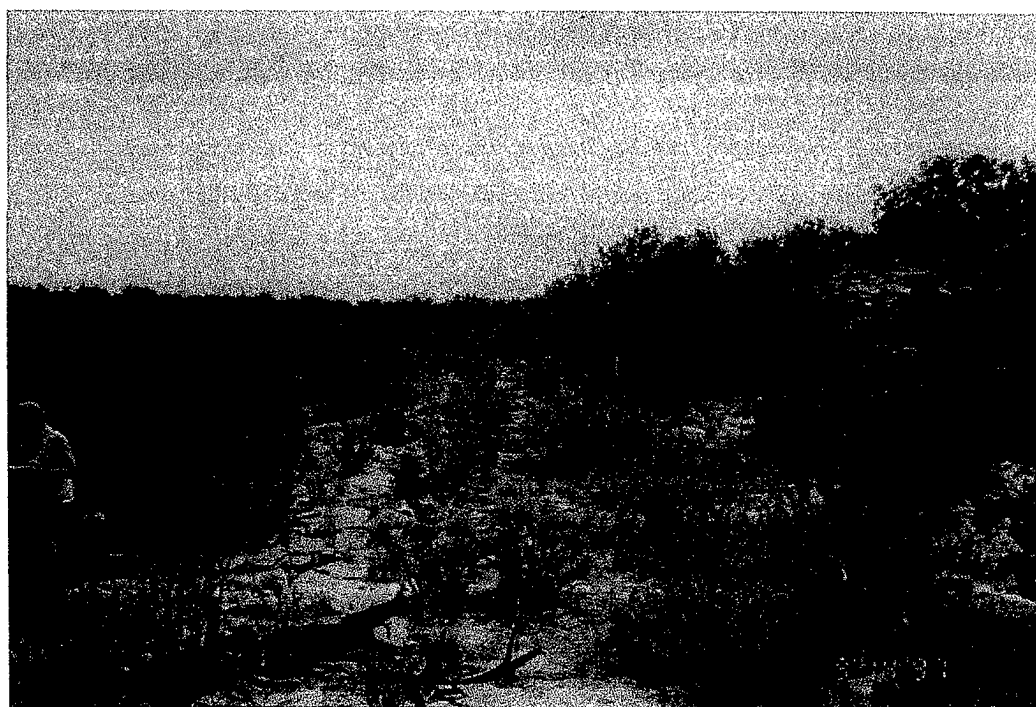
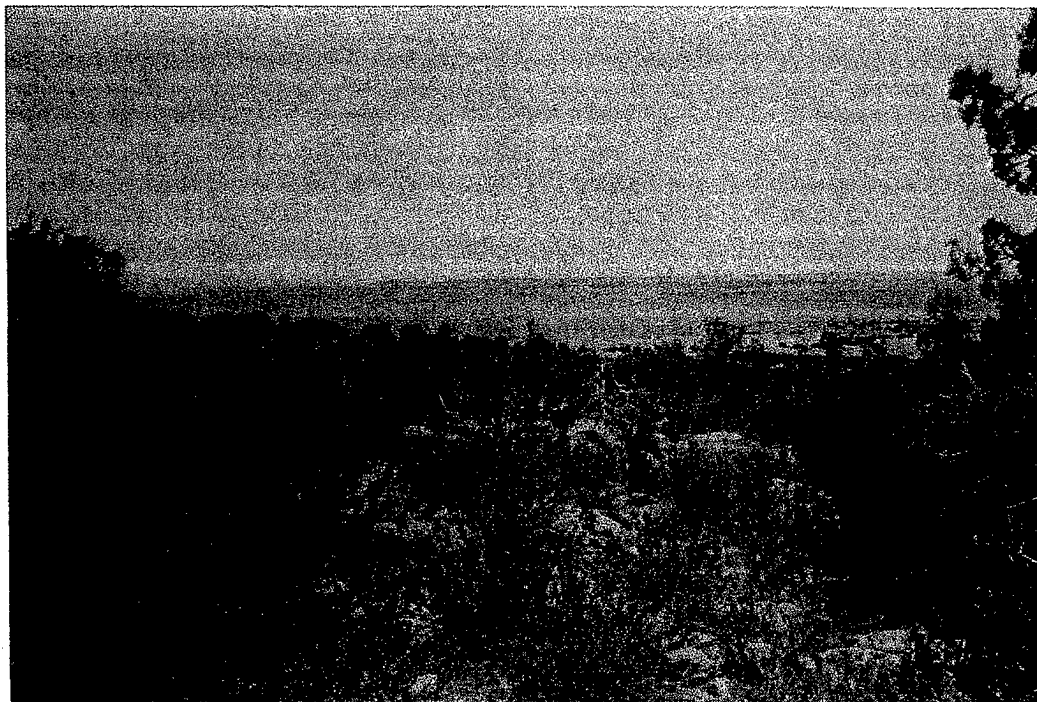


Figure 3.34: Overview photographs of site 5LA7310. Top taken 255° toward the plains. Bottom taken 45° northeast along lateral drainage.

Feature 2 (Figure 3.37) is 10 m southeast of the site datum. The structure is composed of sandstone slabs and measures 5 x 4 m. The northern side abuts exposed bedrock and a rock shelf. None of the sandstone slabs are upright. Deposition within the structure is shallow, with a maximum of approximately 10 cm. This structure is within 12 m of a cliff edge and therefore, according to Kalasz (1989:96), is a Class I, Category 1 structure. No numerical age estimates are associated with this structure type.

Feature 3, located 30 m north northeast of the site datum, is actually a sheltered area formed by large bedrock boulders that extend out of the ground some 50 to 70 cm. The interior area of the structure measures 7 x 3 m. Two pieces of debitage were located within the feature walls. Feature 13 is located 35 m east of the site datum and is composed of outcropping bedrock and cap rock (Figure 3.35). An alignment of sandstone slabs is set on the bedrock and measures 6 x 4 m. None of these slabs are upright.

Two rockshelters with interior walls are also recorded (Features 8, 9, 11, and 12). Features 8 and 9 are located about 60 m and 205 degrees from the site datum (Figure 3.38). Feature 8 is a rockshelter that measures approximately 6 x 4 m. Feature 9 is a small sandstone slab wall located in the southeast corner of the shelter. Features 11 and 12 are located 22 m and 140 degrees from the site datum (Figure 3.39).

Feature 11 is a small rockshelter measuring approximately 4 x 3 m. Feature 12 is a circular wall of sandstone slabs in front of the shelter entrance.

Feature 10 may be the remains of a hearth or small roasting pit located in the streambed 50 m and 295 degrees from the site datum. This feature measures approximately 14 x 3 m.

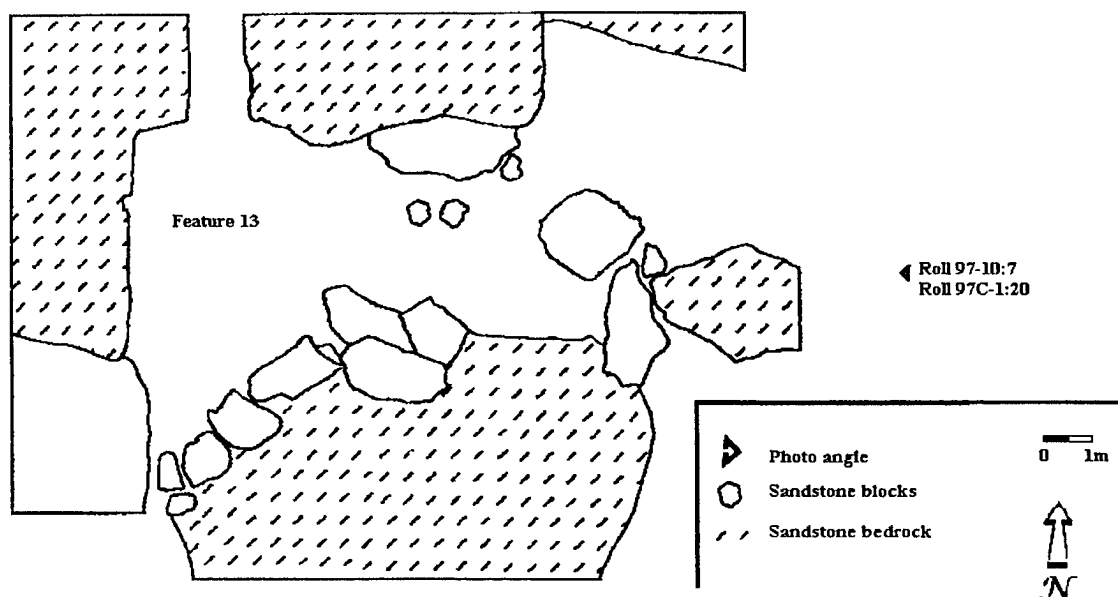


Figure 3.35: Planview of Feature 13, 5LA7310.

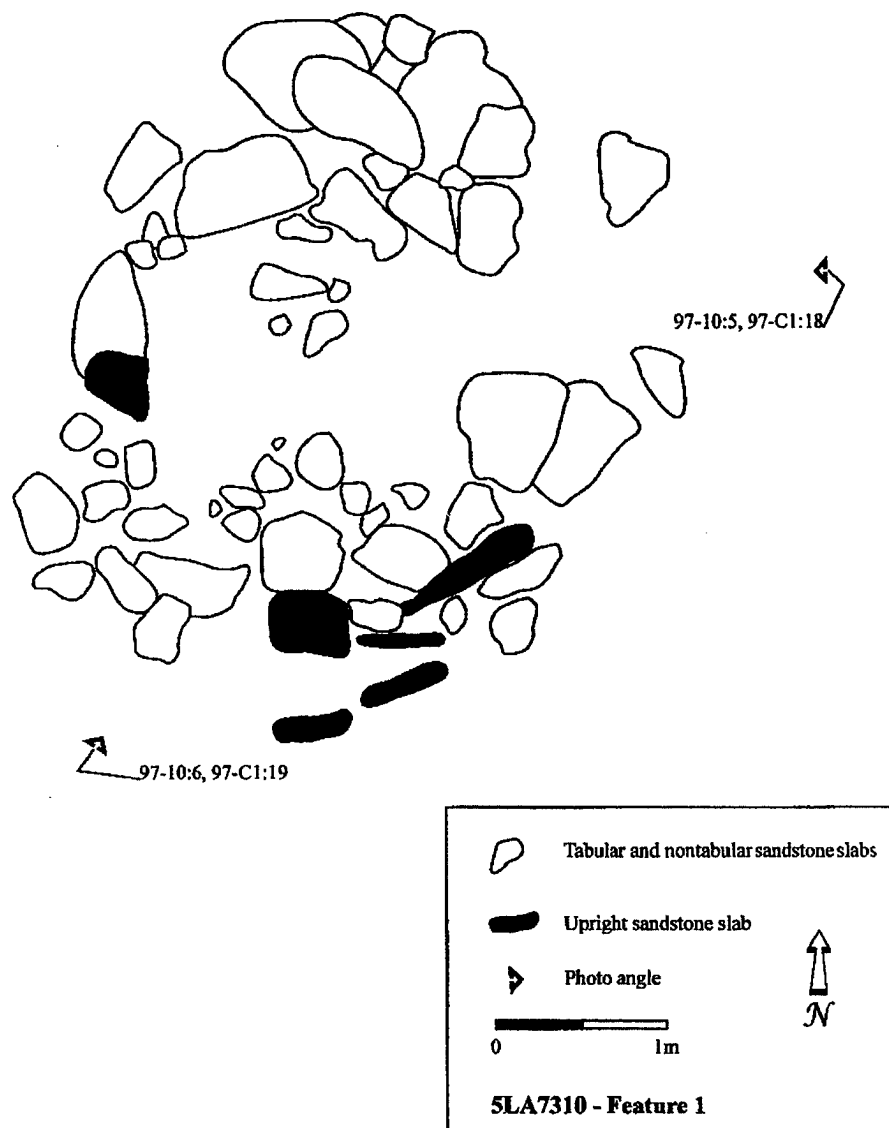


Figure 3.36: Planview, Feature 1, 5LA7310.

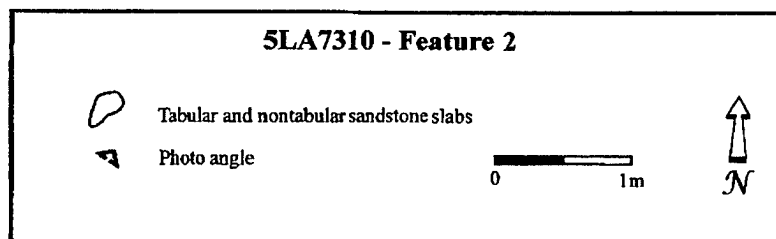
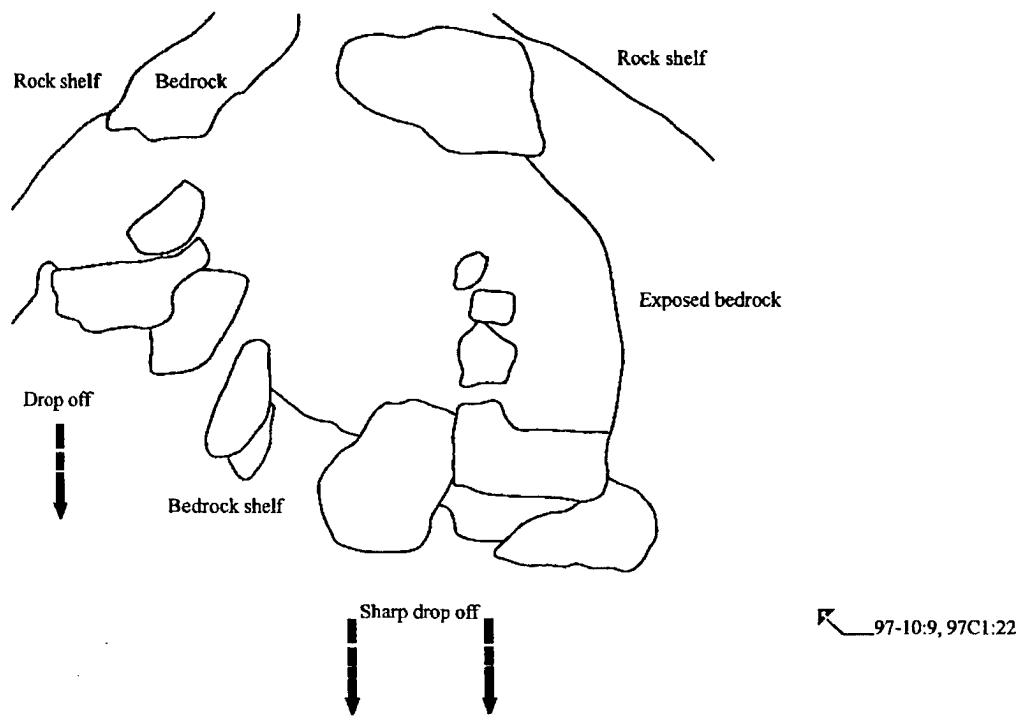


Figure 3.37: Planview, Feature 2, 5LA7310.

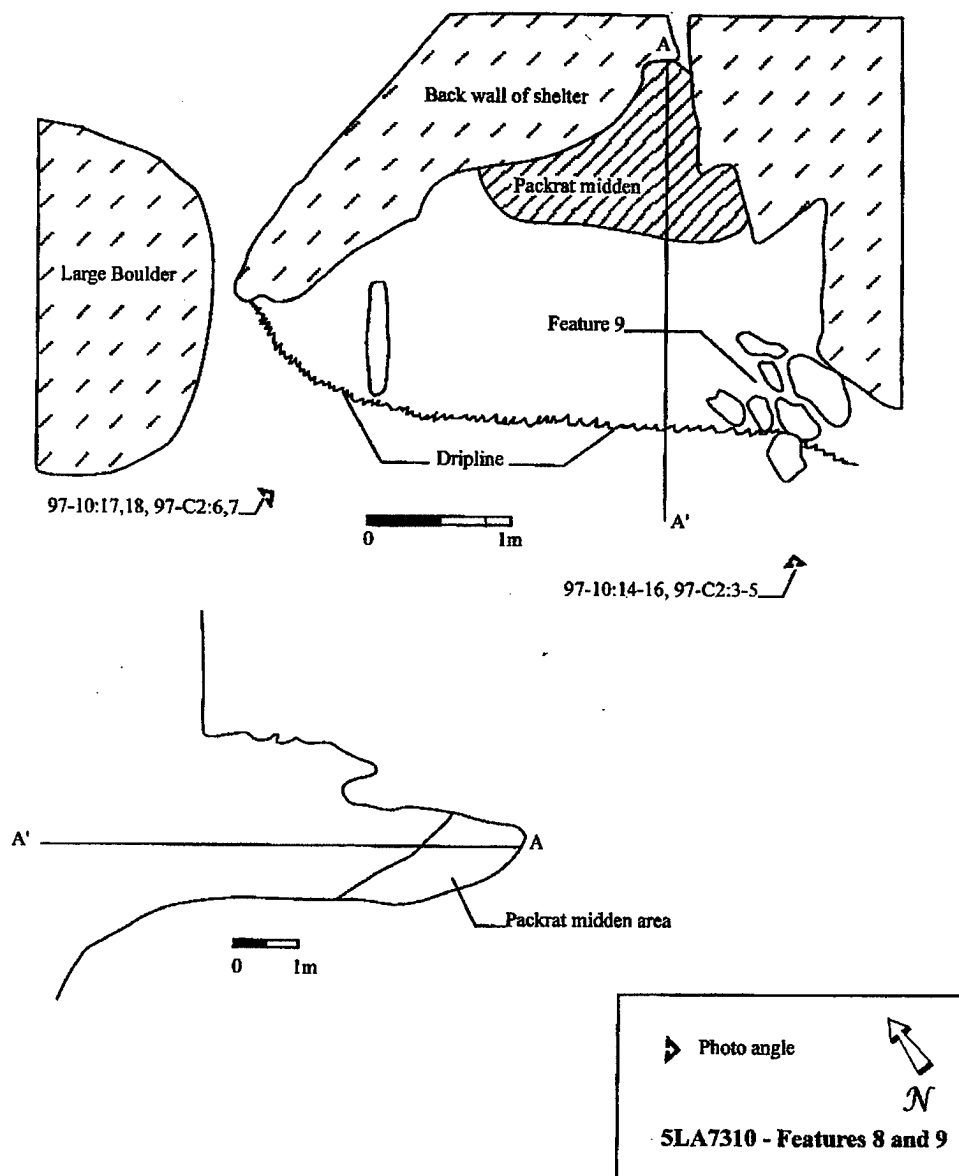


Figure 3.38: Planview and Cross-section, Feature 8 and 9, 5LA7310.

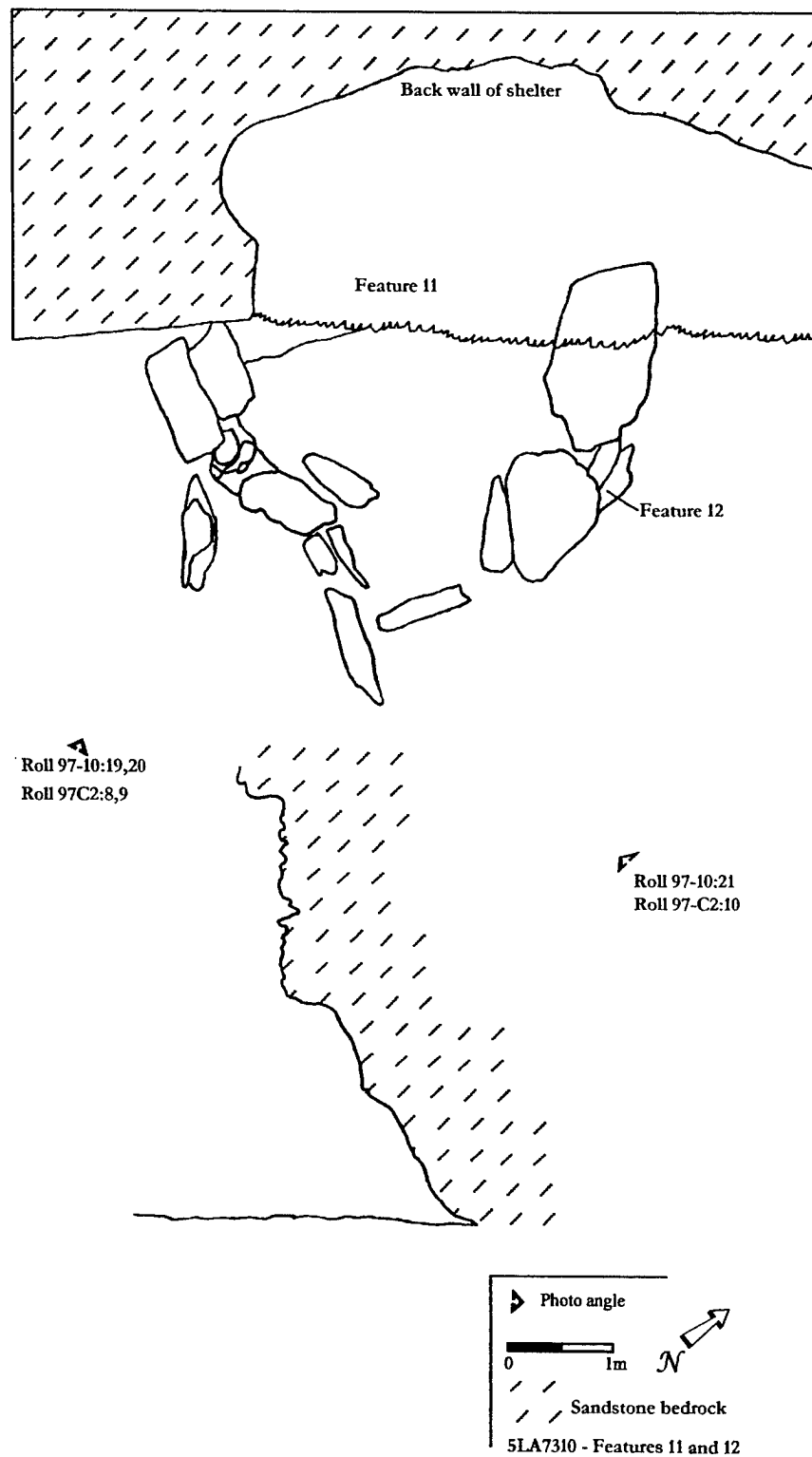


Figure 3.39: Planview and cross-section of Features 11 and 12, 5LA7310.

One hundred eleven pieces of chipped stone were recorded from the site (Table 3.8). This figure represents the total number of flakes noted on the surface of the site. Of the total, 67% is quartzite, 18% is chert, 13% is hornfels/basalt, 1% is argillite, and there is one flake of quartz. Of the quartzite debitage, 82% is the large size grade, 18% is small; 49% has cortex, 51% is noncortical; and 38% is complex flakes, 5% shatter, and 57% simple flakes. Of the chert debitage, 50% is large and 50% is small; 60% is cortical and 40% is noncortical; and 10% is classified as complex, 30% as shatter, and 60% as simple.

Figure 3.40 shows a scatter plot of the quartzite and chert debitage. Based on the plot, it appears that freehand percussion was likely the most important technique in generating both the quartzite and chert debitage. The plot also suggests that the earlier stages of lithic reduction were responsible for generating most of the chert debitage. However, it should be noted that the low count of small chert flakes (10) may be skewing the result; but even so, site 5LA7310 has a high percentage of small, cortical chert flakes. There is also a low count for the small quartzite debitage (13), but this debitage is characterized by a complete lack of small cortical flakes, which indicates that perhaps the later stages of quartzite lithic reduction were carried out at the site. The counts for the remaining material types are too small for meaningful analysis.

Three temporally diagnostic projectile points were recovered from the surface of this site (Figure 3.41). The first point (5LA7310.0.2) is similar to Anderson's (1989) type P42. This type has associated dates that range from A.D. 600 to A.D. 1600. The second projectile point (5LA7310.0.13) is a P83 and ranges in time from A.D. 750 to A.D. 1650. The third point (5LA7310.0.3) is a P79 and has associated dates that range from between A.D. 100 to A.D. 1750. Based on these artifacts, the site likely had a relatively late occupation that started in the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500) and may have extended into the Late Ceramic stage (A.D. 1500 to A.D. 1750).

Two bedrock metates, each with two grinding surfaces, were recorded at the site (Features 4-7). Features 4 and 5 are located approximately 50 m and 190 degrees from the site datum and are two grinding surfaces on the same bedrock outcrop. Feature 4 measures 23 x 38 cm. It is ground and no pecking was visible in its oval-shaped grinding area. Feature 5 measures 26 x 59 cm. It is ground, with no evidence of pecking in or around its oval-shaped grinding surface. Features 6 and 7 are located approximately 60 m and 170 degrees from the site datum and are two grinding surfaces on the same bedrock outcrop. Feature 6 measures 45 x 38 cm. It is ground and lacks evidence for pecking in or around its oval-shaped grinding surface. Feature 7 measures 47 x 37 cm. This feature is ground, but also exhibits some pecking that covers an area of 30 x 17 cm.

In addition to the bedrock metates, four portable pieces of ground stone were recorded at the site. Three of these are manos, each made of sandstone and with two grinding surfaces. The fourth specimen is a flat grinding surface, or perhaps a palette, also made of sandstone and measures approximately 16 x 14 cm.

Table 3.8: Summary Description of Chipped-Stone Debitage for 5LA7310.

	Argillite	Chert	Hornfels/Basalt	Quartz	Quartzite
Total flakes	2	20	14	1	74
Large	1	10	7	1	61
Small	1	10	7	0	13
Cortical	0	12	7	1	36
Noncortical	2	8	7	0	38
Complex	1	2	6	0	28
Shatter	0	6	1	0	4
Simple	1	12	5	1	42
Bifacial-thinning	0	0	1	0	0
Bipolar	0	0	0	0	0

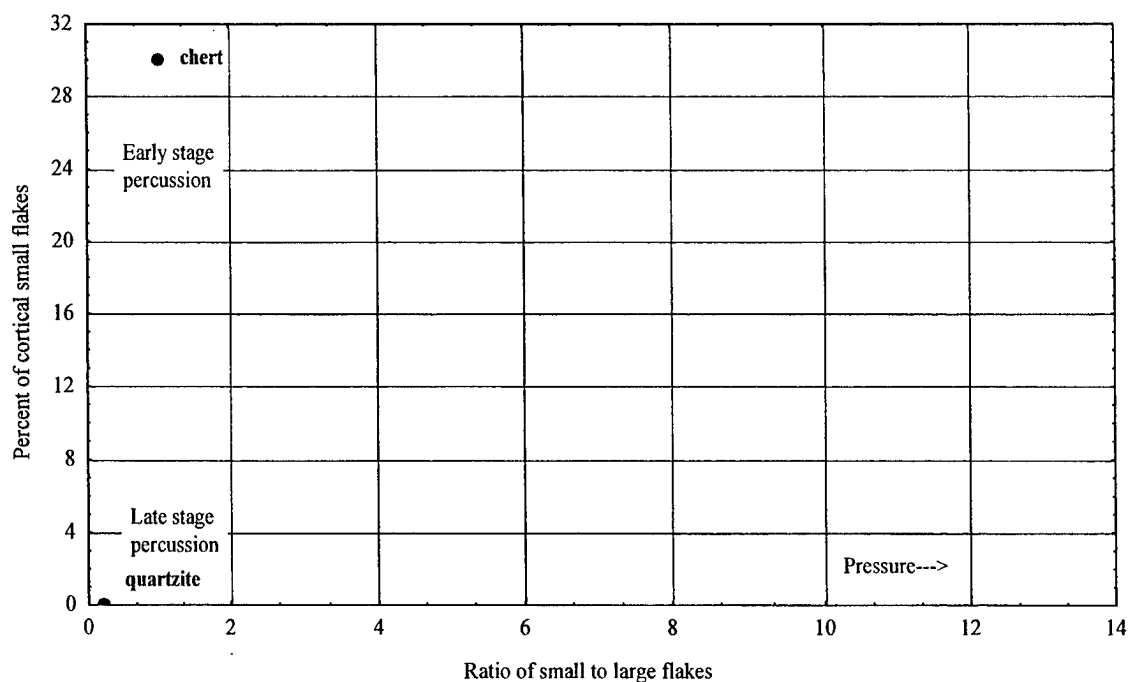


Figure 3.40: Scatter plot of the chert and quartzite debitage from 5LA7310.

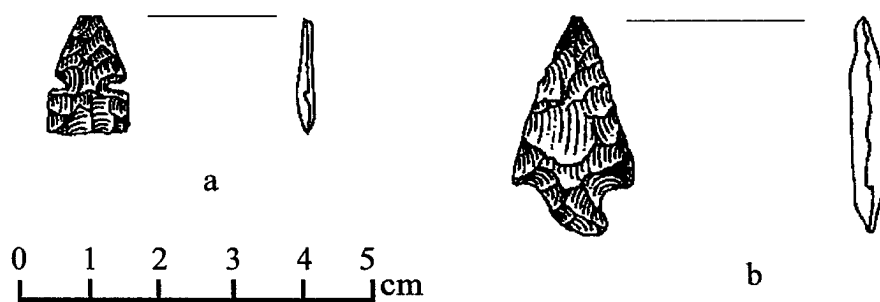


Figure 3.41: Projectile points from site 5LA7310: (a) 5LA7310.0.13; (b) 5LA7310.0.2.

The flaked tool assemblage consists of ten artifacts. Of these, four are non-bipolar cores, three are large bifacial core-tools, one is a biface fragment, one is a broken uniface tool, one is an end/side scraper fragment, and one is a complete utilized flake. Three of the four cores and all of the bifacial core-tools are quartzite. The remaining core is chert. The quartzite biface shows no obvious use wear, and the reduction stage is nearly finished. The finished uniface tool is chert, with steep retouch modification on one face and the distal edge. Light scraper use wear is seen on the distal end. The end/side scraper is finished, with retouched and utilized areas on both lateral edges and the distal end. The utilized flake is quartzite and displays light use wear on the steep right lateral edge.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). This site is a large lithic scatter with a high density of artifacts and at least two structures. Feature 1 is in particularly good condition and has at least 20-30 cm of deposition. There is a good potential for encountering intact subsurface cultural deposits in or around this feature. Several diagnostic artifacts were recovered in addition to ground-stone and bedrock metates. These artifacts indicate that further work at the site will yield information relevant to understanding regional chronology, subsistence, settlement patterns, and paleoenvironment. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating subsurface cultural deposits should be noted and tested to determine their presence or absence.

5LA7311

This is a large lithic scatter and structure site located in the western portion of the project area. It is situated on the east side of a large drainage that cuts across the western slopes rising from the plains to the west (Figure 3.42). The 0.9-acre site is located on a multi-levelled ridge top. This site occupies a low level of the ridge and partly extends up a slope to the east towards a higher level. Site 5LA7311 may be associated with site 5LA7312 (two rockshelters) located 60 m away, over the ridge edge. The site datum is at approximately 1,573 m (5,160 ft) asl. The upper level of the ridge rises about 6 m above the datum.

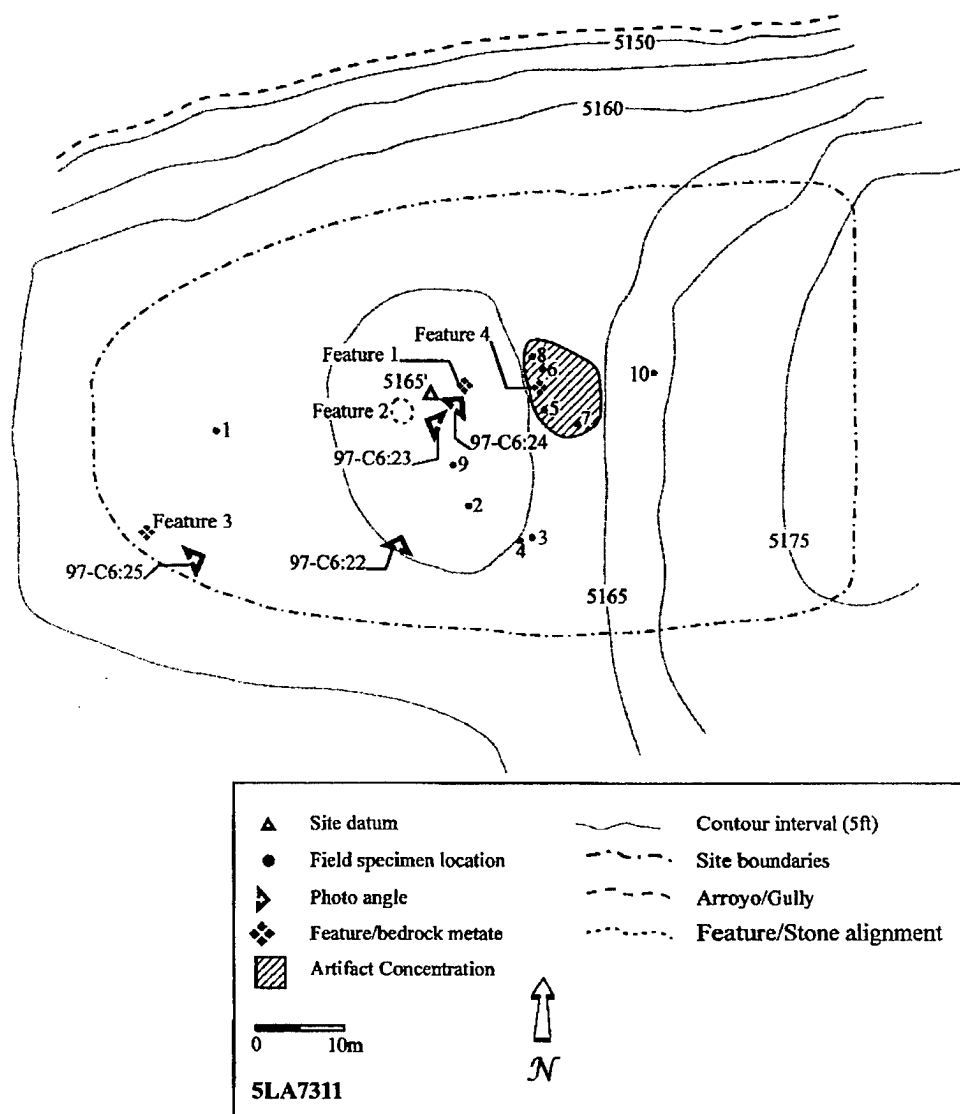


Figure 3.42: Site map, 5LA7311.

The site is located in the juniper scrub vegetative community typical of the Black Hills. Juniper, prickly pear, bunch grasses, and yucca were growing on the site when it was recorded. Soils are relatively thin, and exposed bedrock was common; however, there are areas of up to 10 cm of deposition.

A possible sandstone slab structure (Feature 2) was noted at the site. The stone ring is located approximately 5 m southeast of the site datum, and it measures 4.3 x 2.9 m. A possible hearth represented by an area of ashy gray soil intermixed with rocks (Feature 4) was also noted at approximately 12 m north of the site datum. This feature is located within a lithic concentration that measures approximately 10 x 12 m.

A total of 124 pieces of chipped stone were recorded from the site (Table 3.9). This figure represents the total number of flakes on the ground surface at the time the site was recorded. Four material types were noted. Of the total debitage, 55% is quartzite, 38% is chert, 7% is hornfels/basalt, and there is one argillite flake. Of the quartzite debitage, 79% falls into the large size grade, while 21% is recorded as small; 68% has cortex and 32% of the debitage is noncortical; and 53% is recorded as complex flakes, 3% as shatter, and 44% as simple flakes. Of the chert debitage, 28% is large and 72% is small; 47% is cortical and 53% is noncortical; and 32% is classified as complex, 11% as shatter, and 57% as simple.

Figure 3.43 shows a scatter plot of the quartzite and chert debitage. Based on the plot, it appears that freehand percussion was likely the most important technique in generating both the quartzite and chert debitage. The plot also suggests that the earlier stages of lithic reduction were responsible for generating most of the chert debitage. The high percentage of small, cortical chert flakes, combined with a relatively high ratio of small-to-large chert flakes, may indicate that the initial size of the chert cores, reduced on the site, was small. The count of small, quartzite flakes is somewhat low (14) and may be skewing the results. However, the quartzite debitage is characterized by a somewhat lower-than-average percentage of small cortical flakes, suggesting that the later stages of quartzite lithic reduction may have been carried out at the site. The counts for the remaining material types are too low for meaningful analysis.

Only one diagnostic projectile point (5LA7311.0.6) was recovered from the surface of the site (Figure 3.44). This specimen closely resembles Anderson's (1989) P62 type, which has associated dates that range from A.D. 500 to A.D. 1400. Based on this artifact, we can infer that the site was occupied some time during either the Early or Middle Ceramic stages (A.D. 200 to A.D. 1500).

The stone tools consist of two complete scrapers, one chert biface fragment, one fine-grained quartzite uniface tool, and one chert core. The finished end/side scraper is made of quartzite and exhibits heavy retouch modification and moderate use wear along the left lateral edge and the distal end. The end scraper is classified as nearly finished and is made of quartzite. A single unidirectionally retouched edge is seen on the distal end, with light use wear along the margin. Retouch modification and light scraper use wear is seen along the steep left lateral edge of the uniface tool fragment. No visible use wear is noted on the unfinished biface specimen.

Table 3.9: Summary Description of Chipped-stone Debitage for 5LA7311.

	Argillite	Chert	Hornfels/Basalt	Quartzite
Total flakes	1	47	8	68
Large	1	13	7	54
Small	0	34	1	14
Cortical	1	22	4	46
Noncortical	0	25	4	22
Complex	1	15	6	36
Shatter	0	5	0	2
Simple	0	27	2	30
Bifacial thinning	0	0	0	0
Bipolar	0	0	0	0

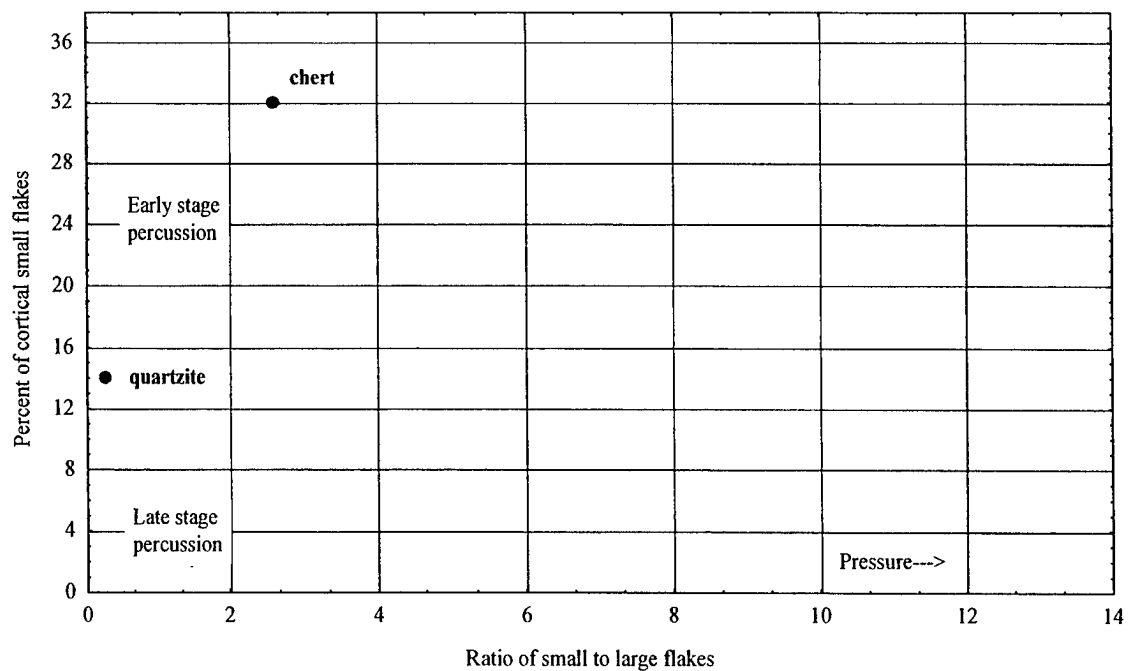


Figure 3.43: Scatter plot of the chert and quartzite debitage for 5LA7311.

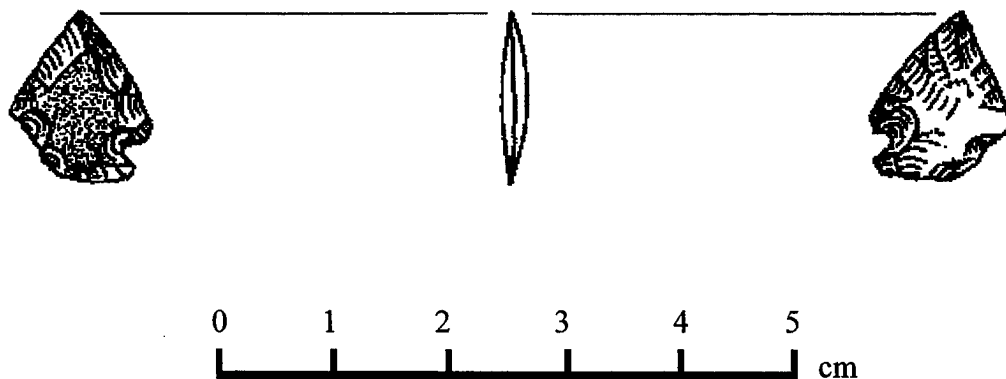


Figure 3.44: Projectile point (5LA7311.0.6) from the surface of 5LA7311.

Two bedrock metates were recorded at the site (Features 1 and 3). Feature 1 is located 5 m north of the site datum, and Feature 3 is approximately 35 m to the south-southeast of the datum. Two other metates and one mano were also found on the site. The mano is a rather large (15.75 x 9.5 cm) two-handed mano made of quartzite and exhibiting light use wear. The two metates are both made from sandstone; one is flat and the other has a shallow basin.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The presence of structures and the site's location in an isolated position on the point of a ridge is precisely the sort of location where many Early Ceramic and Middle Ceramic villages are found in the region. It suggests that the site will be useful for addressing questions concerning settlement patterns. Furthermore, 5LA7311 may be associated with site 5LA7312, which is comprised of two rockshelters, located 60 m away and over the ridge edge. The potential for buried thermal features in or around Feature 4 and the presence of ground stone may also indicate the likelihood that pollen, faunal, and macrobotanical remains useful in reconstructing subsistence and paleoenvironment may be recovered through the excavation of test units. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating subsurface cultural deposits should be noted and tested.

5LA7333

The site is a lithic scatter and rockshelter site located at the head of a canyon that is a tributary of Stage Canyon (Figures 3.45 and 3.46). The lithic scatter is situated on top of the ridge and extends down the slopes of the canyon where two, possibly four, rockshelters can be found. Ephemeral seeps are found in the rockshelters, and there was standing water in potholes in the drainage below. The site covers an area of approximately 1.3 acres and extends from the ridge top to the drainage bottom in the west. The site datum is on the ridge top at approximately 1,585 m (5,200 ft) asl. The drainage bottom is about 15 m below the ridge top.

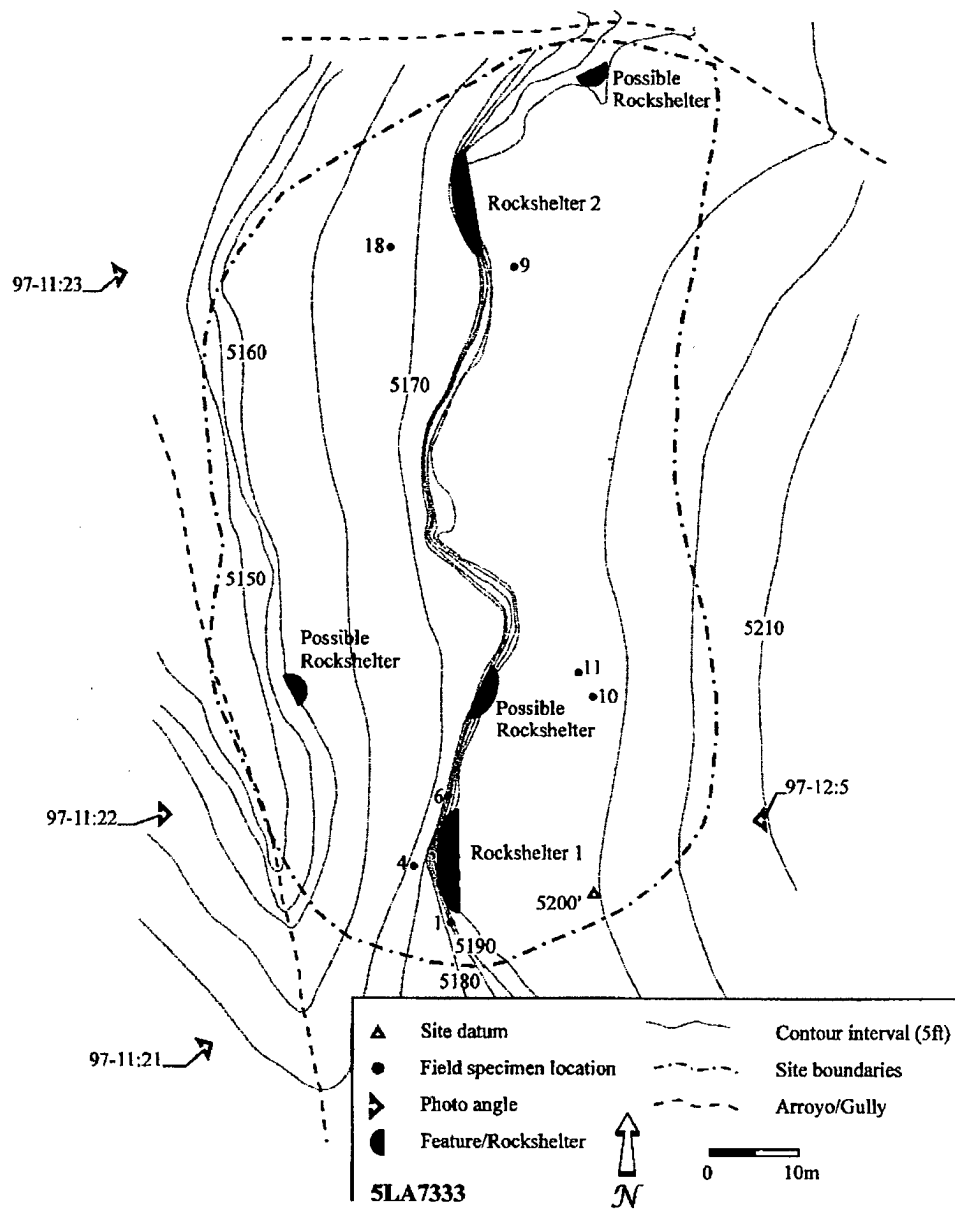


Figure 3.45: Site map, 5LA7333.

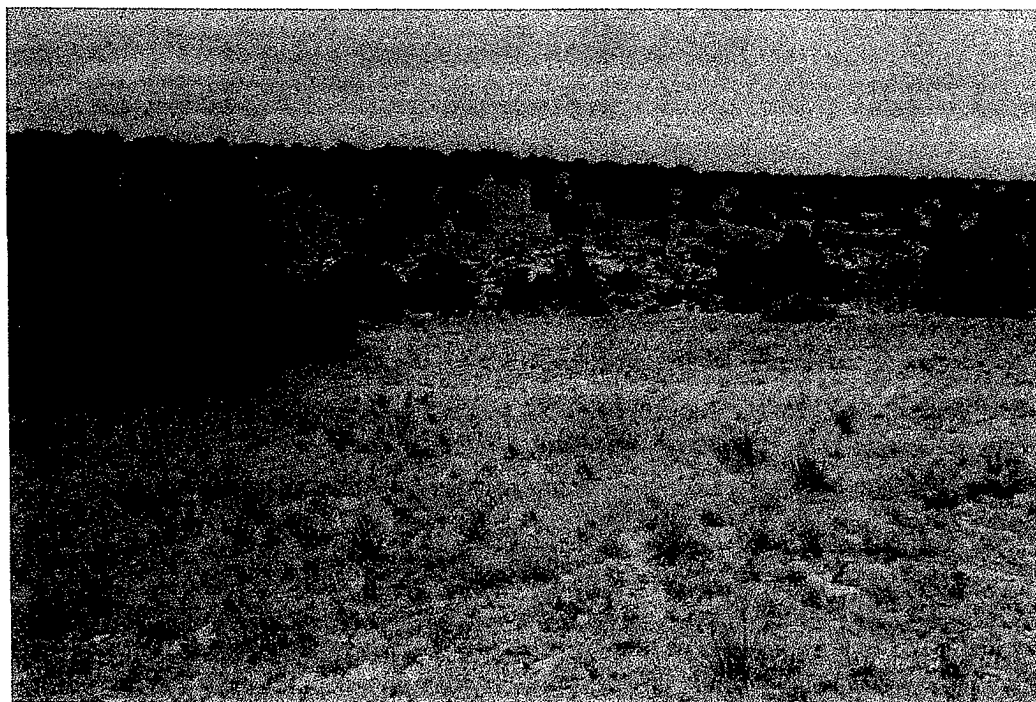


Figure 3.46: Site overview of 5LA7333 above shelters on ridge looking out over Shelter

1.

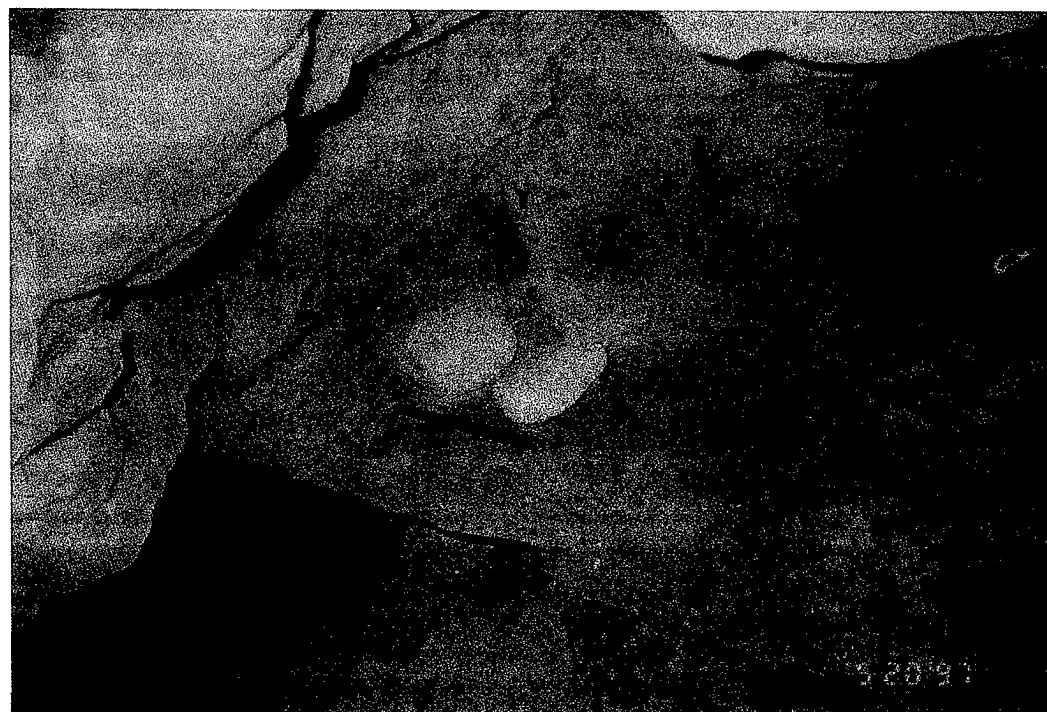


Figure 3.47: Mano cache at north end of Shelter 1.

The site is in the juniper scrub vegetative community typical of the Black Hills. Juniper, grama grasses, ricegrass, mountain mahogany, and moss fern were growing on the site when it was recorded. Soils are variable throughout the site. They tend to be somewhat shallow on the ridge top, but deposits reach approximately 30 cm in one of the rockshelters (Rockshelter 1).

Rockshelter 1 is located approximately 15 m west of the site datum (Figure 3.48). It is rather large and composed of two sections or areas. The first section measures approximately 10 x 4.25 m and has two interior enclosures or rooms formed by two contiguous rock walls. One of the rocks in the enclosing wall is upright. The other section is much smaller, measuring only approximately 4 x 1.5 m and has no associated wall alignments. A cache of two manos (FS 16 and 17) were found resting in a small niche in the back wall of the shelter (Figure 3.47). Both of these manos were whole and made from quartzite.

Rockshelter 2 is located 85 m north of the site datum (Figure 3.49). It is also large, measuring approximately 14 x 3.5 m. A small rock enclosure is located in front of an area where the back wall of the shelter extends inward to form a large niche. Several of the sandstone slabs making up the enclosure wall are arranged in an upright position. Additionally, one of the rocks of the enclosing wall is a shallow basin metate (FS 19) with longitudinal striations.

Including those already mentioned, a total of eight pieces of ground stone were found in or around the two rockshelters. Two other possible rockshelters were noted on the talus slopes leading down to the drainage bottom, but they had no associated artifacts nor other indications of human use.

A total of only 34 pieces of chipped stone were recorded from the site (Table 3.10). This figure represents the total number of flakes on the surface at the time the site was recorded. Of the total debitage, 71% is quartzite, 24% is chert, and 6% is hornfels/basalt. Of the quartzite debitage, 88% is classified as a large size grade, while 12% is recorded as small; 17% has cortex and 83% of the debitage is noncortical; and 21% is recorded as complex flakes, 4% as shatter, and 75% as simple flakes.

Table 3.10: Summary Description of Chipped-Stone Debitage for 5LA7333.

	Chert	Hornfels/Basalt	Quartzite
Total flakes	8	2	24
Large	5	1	21
Small	3	1	3
Cortical	0	0	4
Noncortical	8	2	20
Complex	3	1	5
Shatter	1	0	1
Simple	4	1	18
Bifacial-thinning	0	0	0
Bipolar	0	0	0

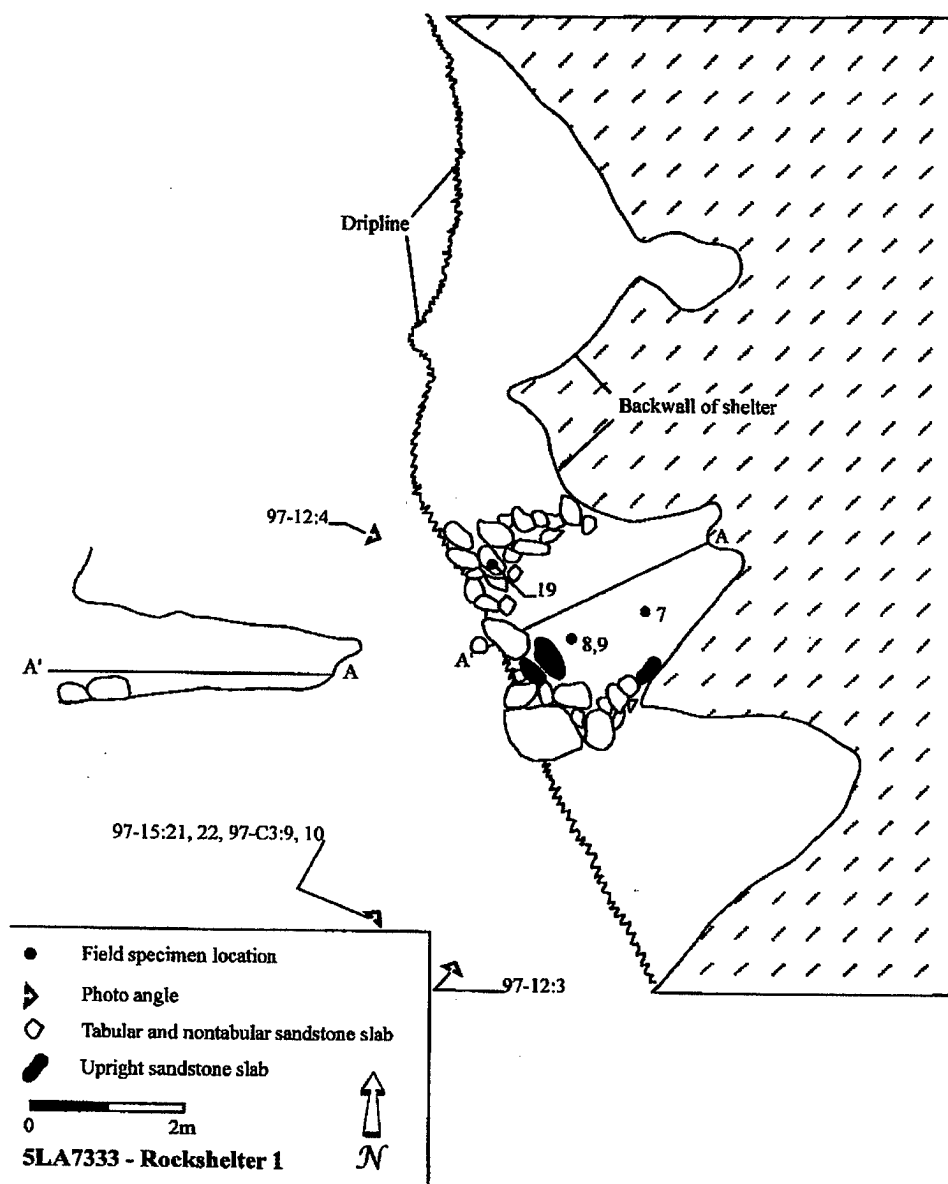


Figure 3.48: Planview and Cross-section, Rockshelter 1, 5LA7333.

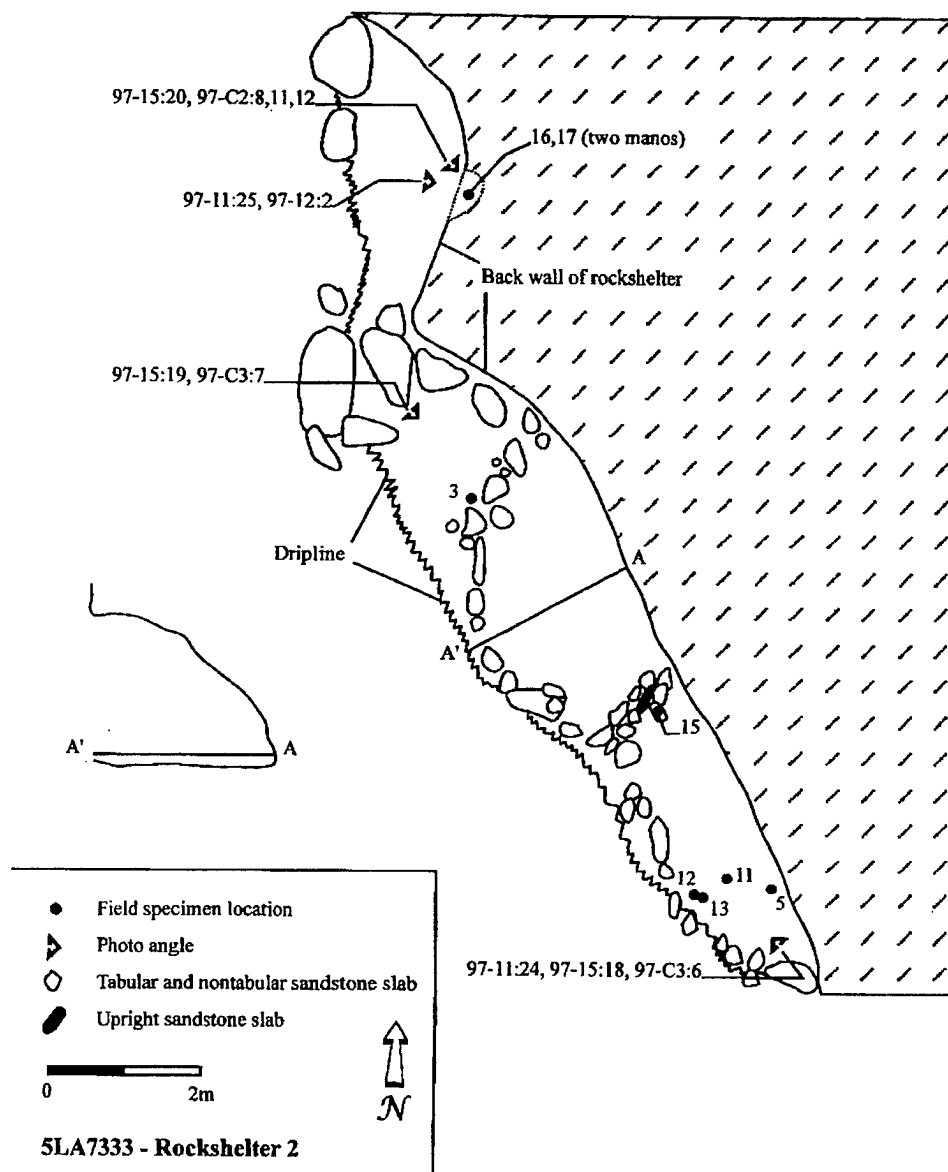


Figure 3.49: Planview and Cross-section, Rockshelter 2, 5LA7333.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The presence of rockshelters suggests that the site is useful for addressing questions concerning settlement patterns. There is good potential for the presence of buried deposits in Rockshelter 1, and the presence of several pieces of ground stone indicates the likelihood that pollen, faunal, and macrobotanical remains useful in reconstructing subsistence and paleoenvironment will be recovered through the excavation of test units. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating subsurface cultural deposits should be noted and tested to determine their presence or absence. Testing should be carried out in and around Rockshelter 1, given its depth of soil deposits and its association with ground stone and the stone enclosing walls.

5LA7341

The site is located on the western end of the Black Hills adjacent to a large, east-to-west trending drainage that bends southward just east of the site. The 1.5-acre lithic scatter occupies a low knoll at the mouth of this drainage. Artifacts were seen on top of the knoll, along its sides, and in the flats to the east (Figure 3.50 and 3.51). Artifact density is generally variable, with the highest densities near the site datum where artifacts are spaced approximately 3-5 m apart. Density drops off on the perimeter of the site, with artifacts spaced at about 15 m apart. The datum is at approximately 1,532 m (5,025 ft) asl, and the knoll on which the majority of the site is situated rises about 5 m above the surrounding flats.

Located in a vegetative community dominated by juniper, the on-site vegetation also includes the *Opuntias* and various grama grasses, which normally are found in the region. Soils are relatively shallow (up to ca. 20 cm), and erosion has exposed bedrock on a knoll in the northwest quadrant and downslope to the west. There may be some intact deposits in the open area between the knoll and hill to the east of the site where soils are fairly well developed.

No formal features were identified, but burned bone was found in a small area at the southwest end of the site. No burned soil was found associated with this area, although a large, thinned, patterned biface made of quartzite (FS 7) was recovered near this location.

Table 3.11 presents a summary of the chipped-stone debitage recorded at the site. A total of 133 pieces of chipped-stone debitage were recorded. This total represents an unsystematically selected sample of the flakes located on the ground surface at the time the site was recorded. Of the total, 51% is quartzite, 41% is chert, 4% is hornfels/basalt, 2% is argillite, and 2% is chalcedony. Of the quartzite debitage, 65% falls into the large size grade while 35% is recorded as small; 43% of the debitage has cortex and 57% is noncortical; and 44% is recorded as complex flakes, 10% as shatter, and 46% as simple flakes. Of the chert debitage, 38% is large and 62% is small; 9% is cortical and 91% is noncortical; and 35% is classified as complex, 9% as shatter, 49% as simple, and 7% as bifacial-thinning flakes.

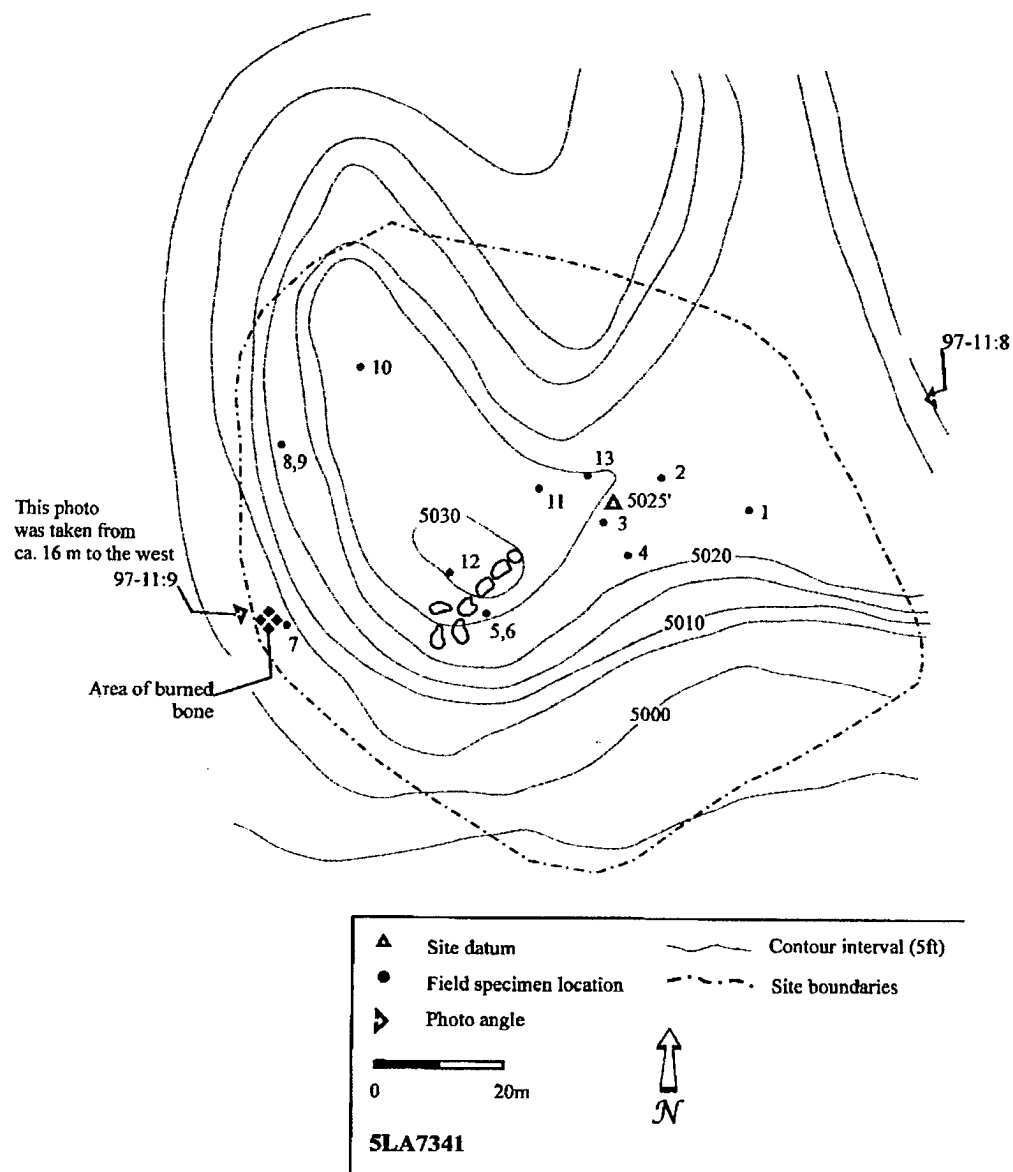


Figure 3.50: Site map, 5LA7341.

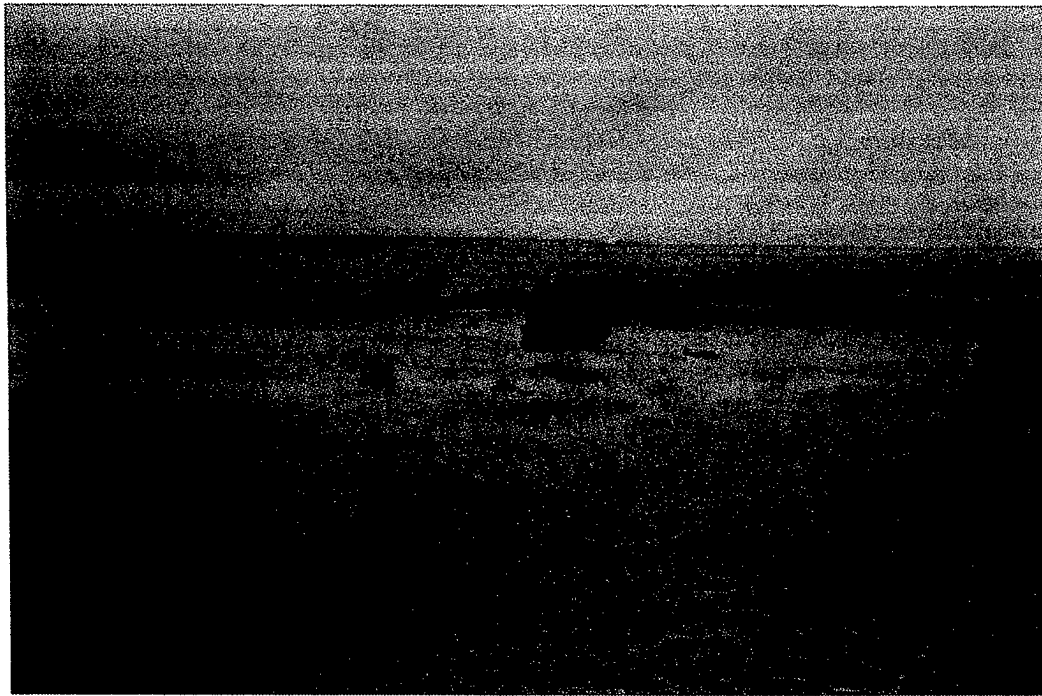


Figure 3.51: Overview of Site 5LA7341 taken from a point near the datum of 5LA7310 facing 213°.

Figure 3.52 shows a scatter plot of both the quartzite and chert and indicates that freehand percussion generated the debitage. The quartzite debitage appears to have been generated by a variety of reduction strategies. However, since the frequency of small cortical flakes is lower than the average for all sites recorded in the 1997 survey, it suggests that perhaps some later stage reduction occurred at the site. The chert debitage plots are consistent with an interpretation of later-stage reduction activities. Counts for argillite, chalcedony, and hornfels/basalt are too low for analysis.

The tool assemblage consists of three biface fragments, one end/side scraper, and one retouched uniface tool. Of the bifaces, two are chert, and one is obsidian. Both the finished and unfinished biface specimens were not utilized, and only bifacial modification was noted. Lightly utilized areas are seen on both lateral edges of the nearly finished biface. The edge angle is less than 45 degrees; so the tool was likely used for cutting. The end/side scraper is complete and made of fine-grained quartzite. This finished specimen shows steep unifacial retouch and light to moderate use wear on both lateral edges and the distal end. The chert uniface tool shows light to moderate use wear on the right lateral edge and the distal end.

A single piece of obsidian was submitted for source analysis (Appendix III). This piece (5LA7341.0.3) is a large, thin, patterned biface that comes from the Cerro al Medio source area of the middle portion of the Jemez Mountains of New Mexico.

Table 3.11: Summary Description of Chipped-stone Debitage for 5LA7341.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Quartzite
Total flakes	3	2	55	5	68
Large	1	0	21	1	44
Small	2	2	34	4	24
Cortical	0	0	5	1	29
Noncortical	3	2	50	4	39
Complex	2	0	19	1	30
Shatter	0	0	5	0	7
Simple	1	2	27	4	31
Bifacial-thinning	0	0	4	0	0
Bipolar	0	0	0	0	0

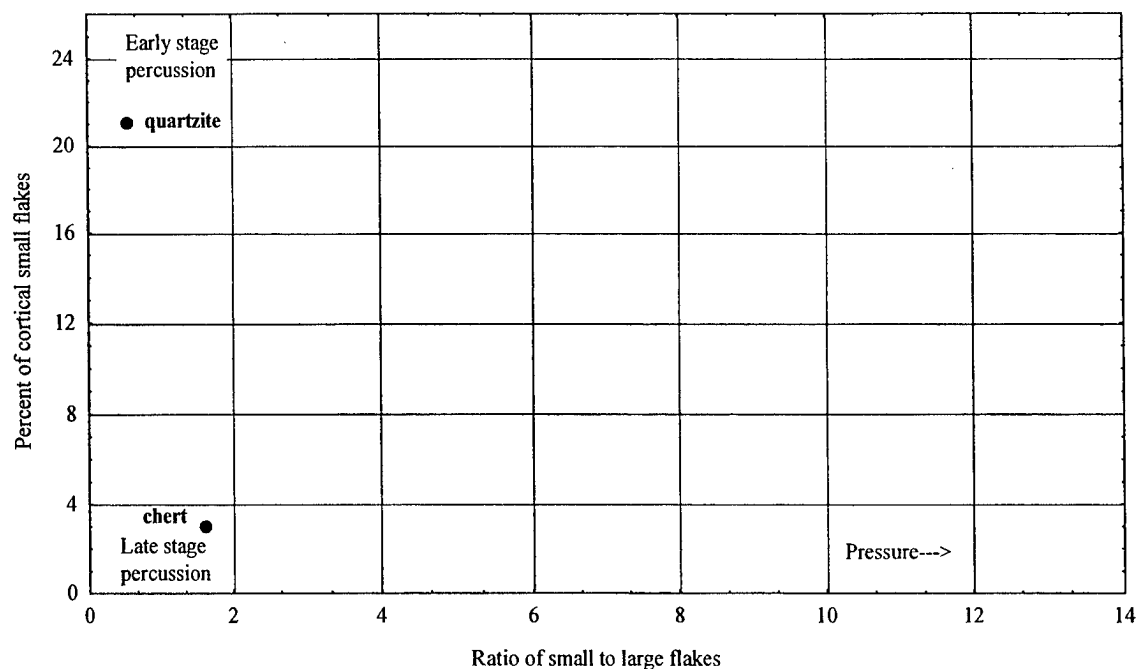


Figure 3.52: Scatter plot of the chert and quartzite debitage for 5LA7341.

Six diagnostic projectile points were recovered from the site surface (Figure 3.53). Five of the projectile points seem to suggest an occupation date for the site that falls within Middle Ceramic or Late Ceramic Stages (A.D. 800/1000 to A.D. 1750). Three of these (5LA7341.0.6, 5LA7341.0.7, and 5LA7341.0.12) most closely resemble Anderson's (1989) P79 type, which has associated dates that range from A.D. 1000 to A.D. 1750. Two other specimens (5LA7341.0.2 and 5LA7341.0.5) are similar to Anderson's P83 type, which has associated dates of between A.D. 750 and A.D. 1650. One projectile point (5LA7341.0.4) fits within the Early Ceramic Stage (A.D. 200 to A.D. 800/1000). It can be ascribed to Anderson's P27 type and has a temporal range between 500 B.C. and A.D. 1150. One specimen is possibly affiliated with the Middle-to-Late Archaic stages (3000 B.C. to A.D. 200). It most closely resembles Anderson's P4 type, which has associated dates of between 4000 B.C. and A.D. 500.

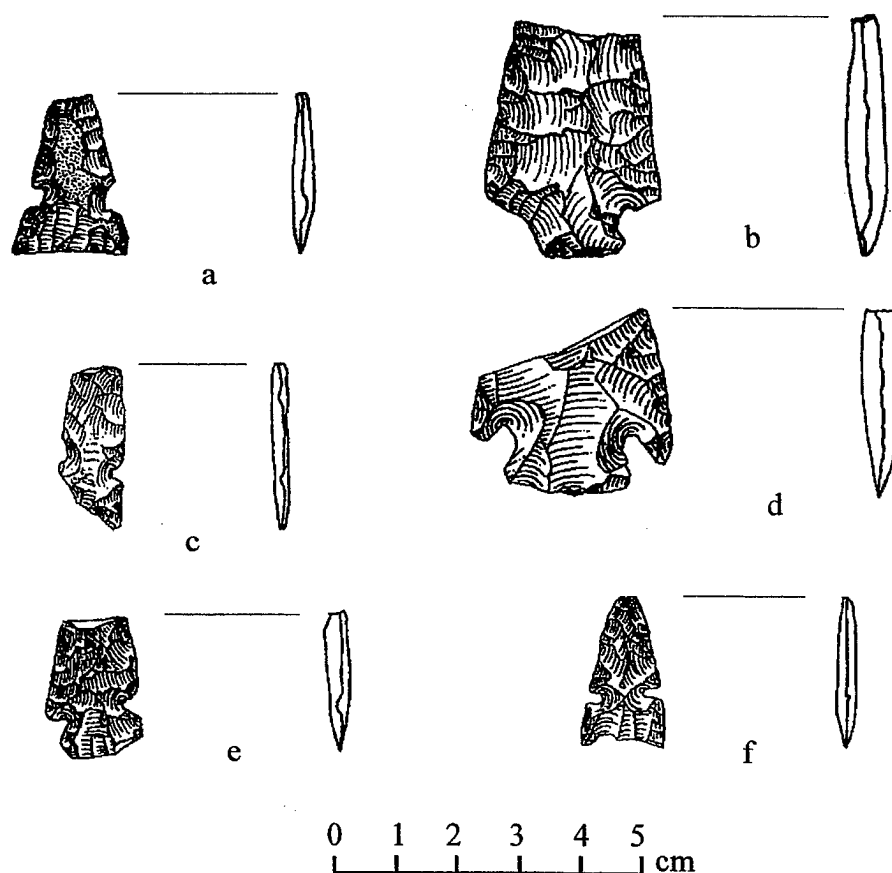


Figure 3.53: Projectile points from the surface of 5LA7341: (a) 5LA7341.0.7; (b) 5LA7341.0.4; (c) 5LA7341.0.5; (d) 5LA7341.0.2; (e) 5LA7341.0.12; (f) 5LA7341.0.6.

Interestingly, no ground stone was recorded on the site; however, it did yield 16 pieces of ceramics from a single polished vessel of unknown form (Appendix II). This was the only polished vessel found in the research.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Although there is little deposition on the knoll at the center of the site, more substantial deposits are present around the edges, especially at the eastern margins where intact buried deposits may be present. Six diagnostic projectile points and 16 ceramic sherds from a polished vessel were found and provide potential chronological information for the site. The presence of burned bone on the southwest edge of the site may indicate the presence of a datable thermal feature, and if more bone could be recovered, it may be useful in reconstructing subsistence patterns. The obsidian biface sourced to the Jemez Mountains indicates that the inhabitants of the site may have been involved in a broad system of trade and exchange with outside groups. Some modern day disturbances were also noted at the site. Some trash such as batteries, buttons, "Meals Ready to Eat" (MRE) wrappers, and coins were scattered across the site. It is likely that this debris was discarded during the 1996 Army maneuvers. If this is the case, the site appears to be at risk of incurring damage from military activities at or around the site. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. In areas where there is a good potential for locating subsurface, cultural deposits should be excavated. The site should be fenced to protect against future military impact.

5LA7342

This large site is located on the western edge of the Black Hills adjacent to a large, east-to-west trending drainage that bends southward just north and east of the site. The 31.3-acre lithic scatter occupies a ridgeline and connected slopes. Artifact density is variable, with occasional clusters generally found in areas of erosion (Figures 3.54 and 3.55). The site datum is on top of the ridge at an elevation of approximately 1,567 m (5140 ft) asl, but the site elevation ranges to a low point of approximately 1,506 m (4,940 ft) near the adjacent drainage and the flats to the west. There is some evidence for the testing of raw materials on-site. Cap rock is present below the crest of the ridgeline, but neither rock shelters nor other features were found.

The site is located in piñon/juniper along the top of the ridge. Soils include light-brown sandy loams with unknown depths, but there are areas of this site where it is suspected there may be intact buried deposits. The vegetation on-site includes juniper, bunch grass, yucca, prickly pear, and cholla.

A total of 182 pieces of chipped-stone debitage were recorded from the site (Table 3.12). This total represents an unsystematically selected sample of the flakes on the surface at the time the site was recorded. Eight material types were noted, which is a relatively wide range even for the sites in the western portion of the project area. The majority of the debitage specimens are made of quartzite (42%) and chert (31%). The remaining 27% is chalcedony, argillite, hornfels/basalt, obsidian, and rock quartz.

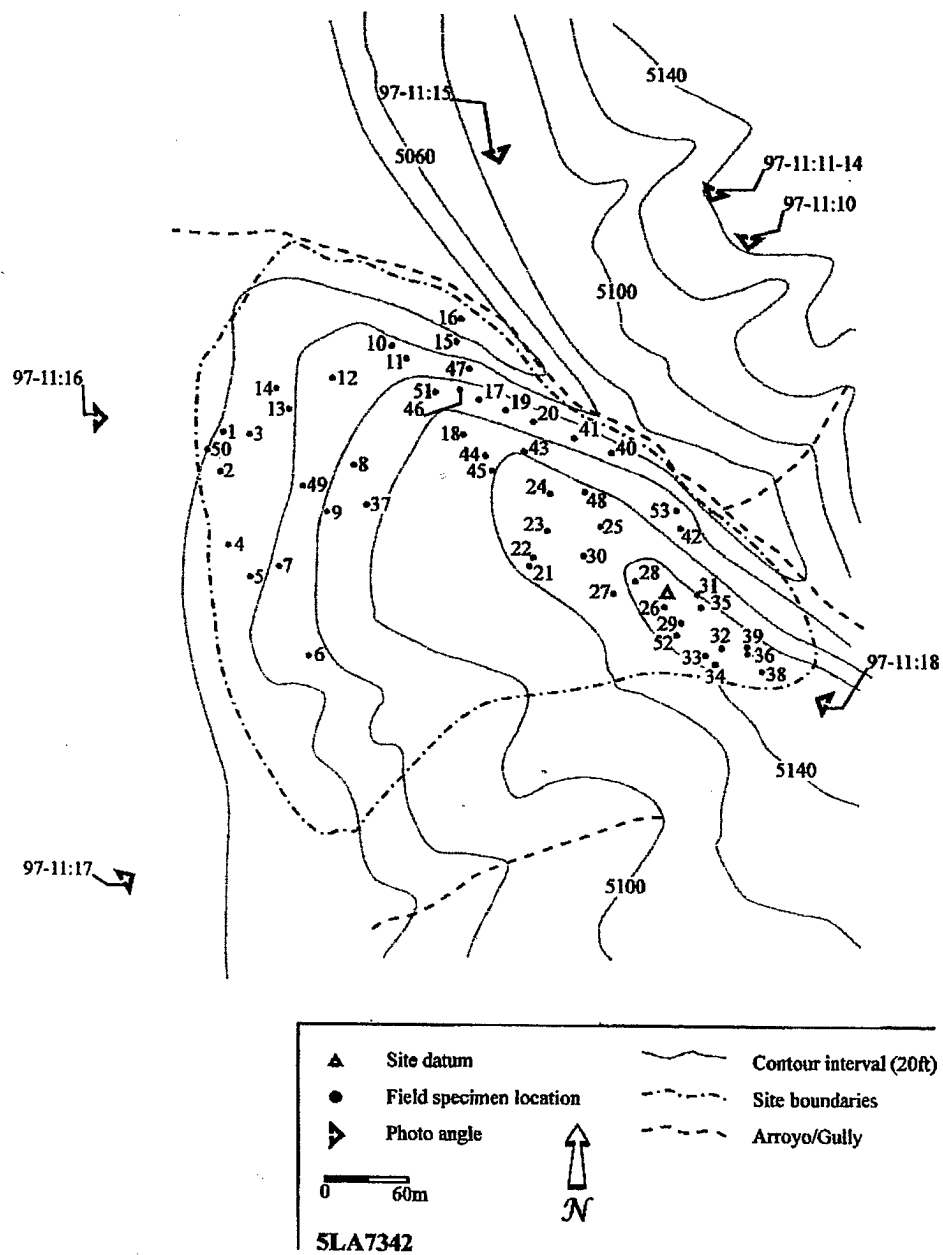


Figure 3.54: Site map, 5LA7342.

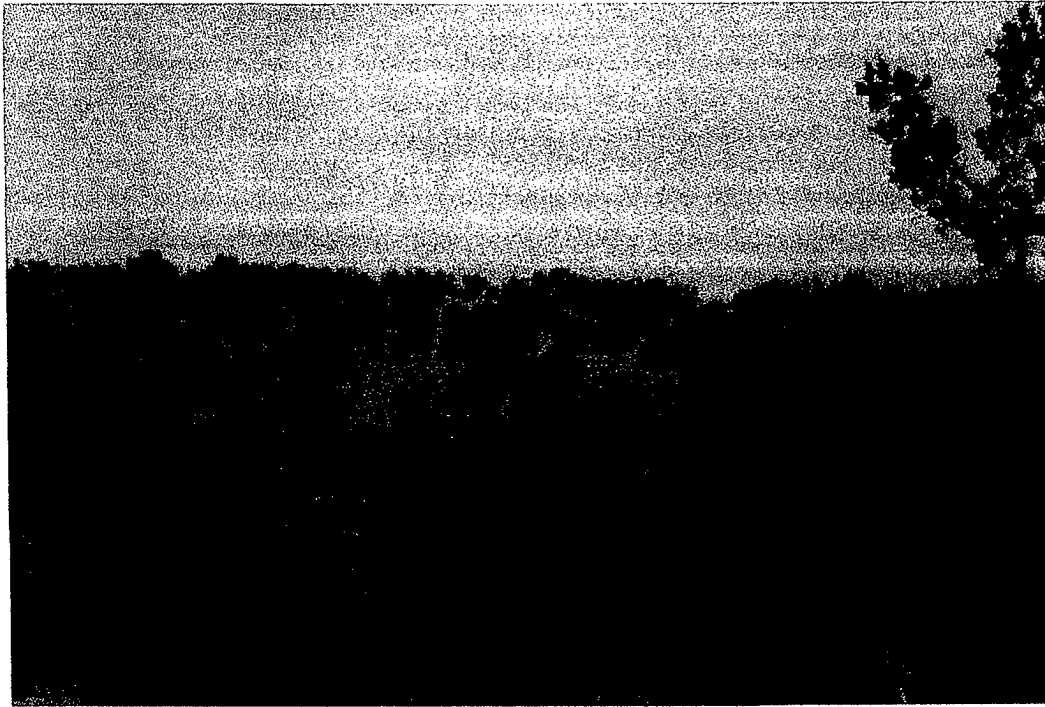


Figure 3.55: Photograph of Site 5LA7342. Overview includes all of ridgeline, portions of forward slope and most of south slope.

Of the quartzite debitage, 59% is the large size grade while 41% is small; 45% of the debitage had cortex and 55% is noncortical; and 57% is recorded as complex flakes, 2% as shatter, and 41% as simple flakes. Of the chert debitage, 20% is large and 80% is small; 82% is cortical and 18% is noncortical; and 27% is classified as complex, 16% as shatter, 52% as simple, and 5% as bifacial-thinning flakes. Two pieces of chert not normally seen in the area were noted, and we believe these specimens may be from a non-local origin.

For the most part, it appears that freehand percussion was the reduction technique used to generate the quartzite debitage (Figure 3.56). However, given the relatively low percentage of cortical small flakes, it appears that some quartzite tool manufacture/maintenance and early-stage core reduction may have occurred simultaneously at the site. The presence of chert bifacial-thinning flakes and the large number of small chert flakes indicate some pressure flaking occurred at the site, and at least one biface of this material was manufactured. A relatively high percentage of the chert flakes are cortical. This information, coupled with the number of small flakes, indicates early- and late-stage lithic reduction activities were utilized. Counts for obsidian, exotic chert, and chalcedony are low, but the few flakes there exhibit, almost exclusively, the features expected for late-stage lithic reduction and most likely tool manufacture or maintenance. Counts for argillite, hornfels/basalt, and quartz are too low for meaningful analysis.

Table 3.12: Summary Description of Chipped-stone Debitage for 5LA7342.

	Argillite	Chalcedony	Chert	Exotic Chert	Hornfels/Basalt	Obsidian	Quartz	Quartzite
Total flakes	15	16	56	2	8	8	1	76
Large	4	1	11	2	6	0	0	45
Small	11	15	45	2	2	8	1	31
Cortical	6	0	46	0	5	0	0	34
Noncortical	9	16	10	2	3	8	1	42
Complex	6	6	15	2	5	8	1	43
Shatter	1	0	9	0	0	0	0	2
Simple	8	10	29	0	3	0	0	31
Bifacial-thinning	0	0	3	0	0	0	0	0
Bipolar	0	0	0	0	0	0	0	0

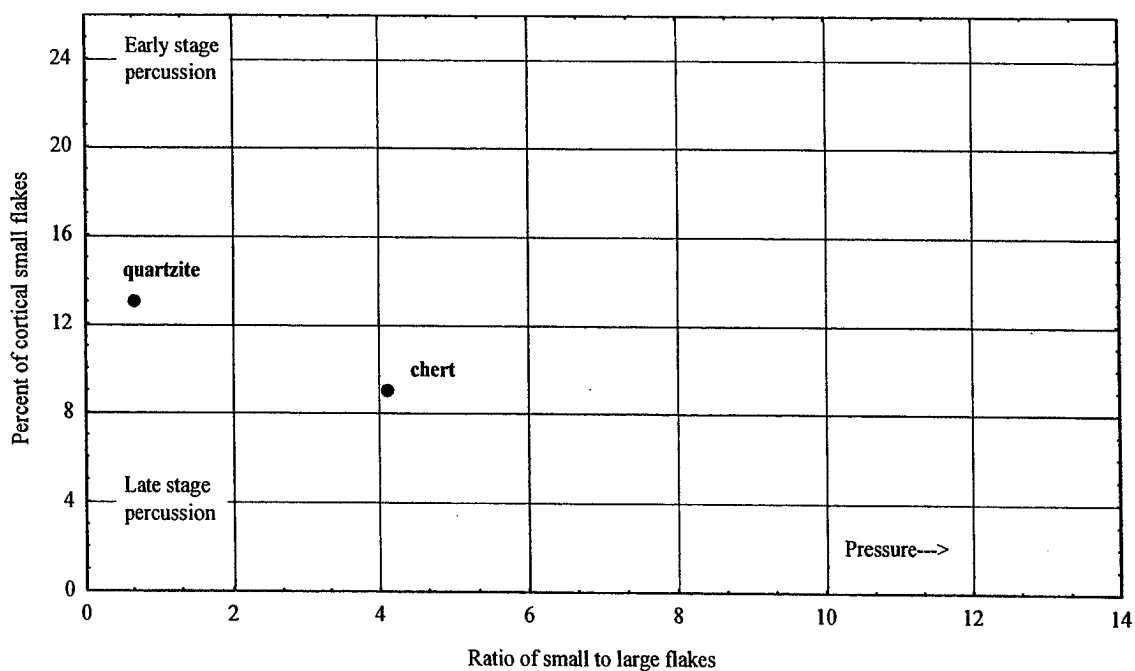


Figure 3.56: Plot of the debitage from 5LA7342.

Several projectile points were recovered from surface contexts at the site; however, only three are diagnostic, according to Anderson's (1989) classification. Two of these projectile points have relatively wide temporal ranges that extend from the middle of the Early Archaic stage to the end of the Early Ceramic stage. One of these specimens (5LA7342.0.14) resembles Anderson's P4 type, which has associated dates that extend from 4000 B.C. to A.D. 500. The second projectile point (5LA7342.0.8) is similar to the P47 type, which has associated dates from 3300 B.C. to A.D. 1000. The third projectile point (5LA7342.0.7) conforms to Anderson's P62 type and has associated dates from A.D. 500 to A.D. 1400. These artifacts suggest two occupations; one dating to sometime during the Archaic stage (5500 B.C. to A.D. 200) and another occupation perhaps within the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

The stone-tool assemblage consists of 22 artifacts, of which eight are bifaces, six are scrapers, three are cores, two are bifacial core-tools, two are utilized flakes, and one is a retouched uniface tool. Material types noted for the cores are coarse-grained quartzite (2) and hornfels/basalt (1). The large core-tools consist of one argillite specimen and one coarse-grained quartzite specimen.

Of the bifaces, seven of the eight specimens are broken. The majority are made of coarse-grained quartzite (5). The remaining three specimens are argillite, obsidian, and fine-grained quartzite. Five of the bifaces were classified as unfinished, and three are nearly finished. Only two of the biface specimens exhibit use wear. The nearly finished quartzite specimen shows light use wear along one acute edge. The other specimen is unfinished and made of coarse-grained quartzite. Light scraping usage is seen on the distal end of the tool.

Three scraper classes were recorded in the stone-tool assemblage. The majority (3) were classified as end scrapers, two are side scrapers, and one is a combination end/side scraper. Half (3) are chert, with fine-grained quartzite (1), coarse-grained quartzite (1), and siltstone (1) making up the remainder. With the exception of one end scraper, all are broken. Reduction stages for the end scrapers are finished (2) and nearly finished (1). Both finished specimens show heavy use wear and retouch modification on the distal end. The nearly finished specimen displays light usage on the distal end. The side scrapers are represented by one finished and one nearly finished specimen. Both show light to moderate use wear on the left lateral edge. The end/side scraper is finished and displays retouch modification and moderate use wear on both lateral edges and the distal end.

The remaining three artifacts are two utilized flakes and a retouched uniface tool. All are coarse-grained quartzite and complete. The uniface tool appears freshly resharpened or modified, and no use wear is visible. Both utilized flakes display light scraping (> 45-degree) use wear on the lateral edges.

Five pieces of obsidian from the site were submitted for source analysis (Appendix III). Two of the pieces (5LA7342.0.12 and 5LA7342.0.16) are sourced to the Polvadera Peak region of the northern Jemez Mountains of New Mexico and one (5LA7342.0.37) to the Cerro del Medio, the middle area of the Jemez Mountains. One specimen (5LA7342.0.32) has a chemical signature similar to that expected for a source area called Wright Creek, near Malad, Idaho. This obsidian may be connected to the protohistoric horse trade between the Utes and Comanches, but

a more systematic and detailed means of testing this hypothesis is necessary. A final specimen (5LA7342.0.24) comes from an unknown geochemical source.

Seven pieces of ground stone were recorded at the site. These were widely distributed throughout the site, with no distinct clustering. Four of the pieces are slab metates with more than 50% of the artifact preserved. Two of the metates are made of quartzite, one is hornfels/basalt, and one is limestone. The limestone metate exhibited some evidence of pecking in the grinding area. Three quartzite manos were recorded. One of these is complete and has three grinding surfaces, including one on its edge. The two main surfaces have circular striations, and some pecking was noted on one of these surfaces. The edge-ground surface showed moderate wear. The orientation of its striations could not be determined. The other two manos are fragmentary, and only one had more than one surface preserved.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Although there is little deposition on the top of the ridge, there are several areas with relatively deep deposits, especially in the eastern portion of the site, and intact buried deposits may be present. Three temporally diagnostic projectile points were found and provide potential chronological information for the site. The obsidian sourced to the Jemez Mountains of New Mexico and Malad, Idaho, and the presence of potentially exotic chert indicate that the inhabitants of the site may have been involved in a broad system of trade and exchange with outside groups. The presence of ground stone also increases the probability that pollen or macrobotanical remains may be recovered from excavations. A considerable amount of evidence (.223 and 7.62 blank cartridges) for military activity was noted at the site. Some shallow ground disturbances are apparent, and tracked vehicles likely caused these. The site appears to be at risk from standard military activities. We suggest the site be revisited for more detailed mapping and more thorough surface collection. Areas where there is potential for locating subsurface cultural deposits should be tested to determine their presence or absence.

5LA7351

This site is located on the western edge of the project area just south and east of a large drainage. The 2.5-acre lithic scatter occupies a ridge between a small drainage and steppes to the west. Artifacts were recorded from the top of the ridge and extending down to the flats of the southwest part of the site (Figure 3.57). The site datum is at approximately 1,567 m (5,140 ft) asl, and the top of the ridge around which the site is organized rises about 5 m above the flats.

Located in a vegetative community dominated by juniper, the vegetation also includes *Opuntias*, yucca, and *Rhus trilobata*. Soil depths are variable across the site, ranging from 2 to over 30 cm.

Three lithic concentrations were recorded in the northern portion of the site. A large area of scattered ash and heat altered stone (Feature 1) that is probably the result of repeated roasting activities is located on the eastern side of the edge. This feature measures 16 x 28 m and is located approximately 20 m southeast of the site datum.

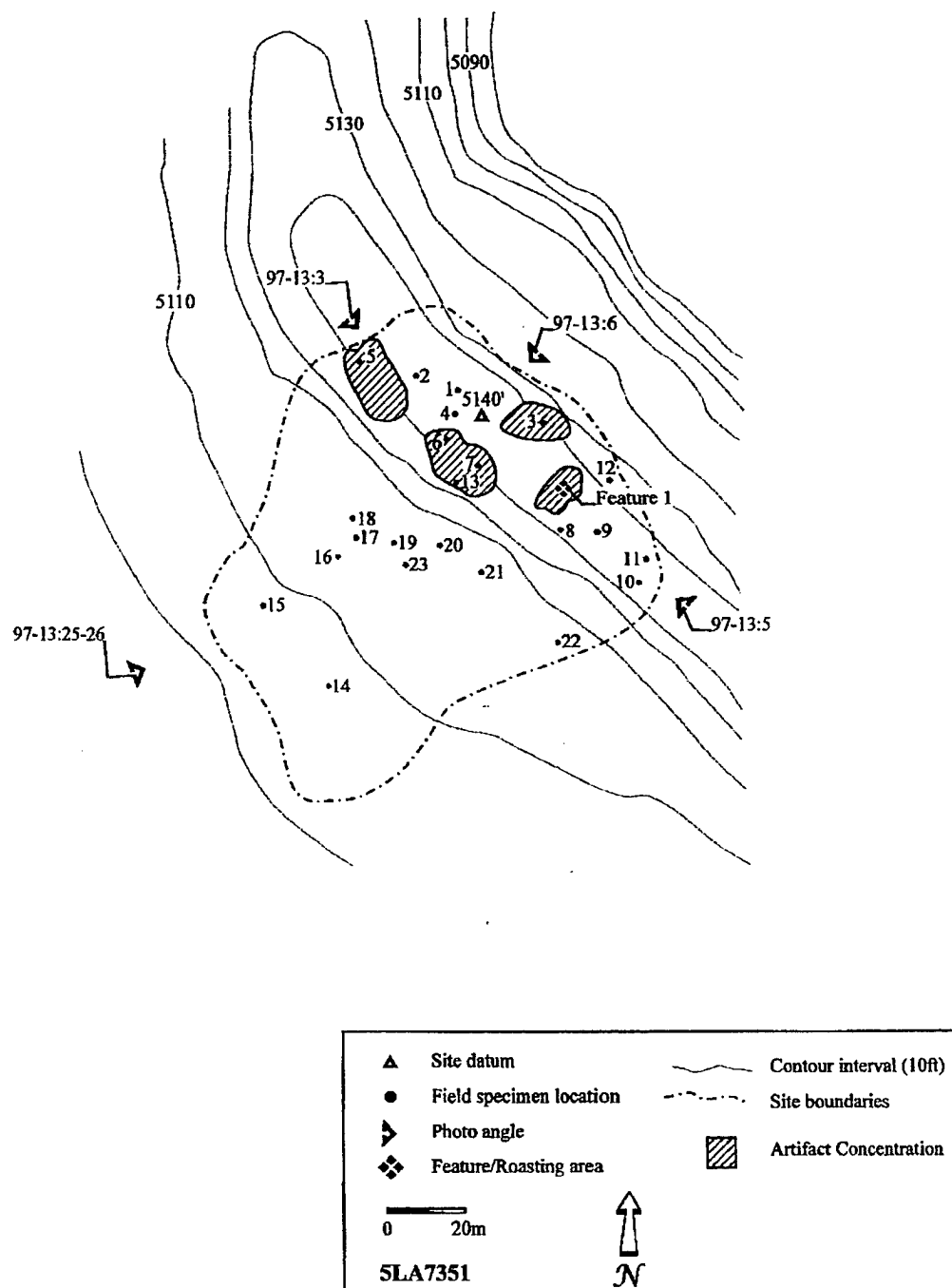


Figure 3.57: Site map, 5LA7351.

Table 3.13: Summary Description of Chipped-stone Debitage for LA7351.

	Argillite	Chert	Hornfels/Basalt	Obsidian	Quartz	Quartzite
Total flakes	1	22	9	10	3	70
Large	0	7	6	0	2	35
Small	1	15	3	10	1	35
Cortical	1	4	1	0	2	28
Noncortical	0	18	8	10	1	42
Complex	0	8	6	2	0	34
Shatter	0	0	0	0	1	6
Simple	1	14	3	8	2	30
Bifacial-thinning	0	0	0	0	0	0
Bipolar	0	0	0	0	0	0

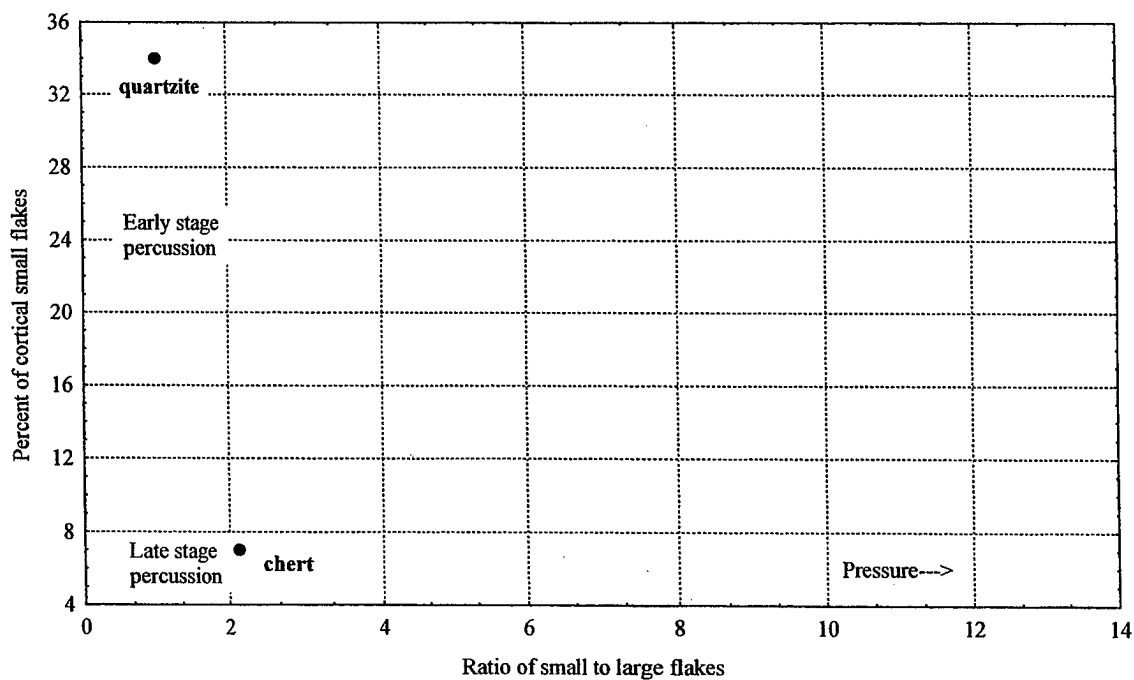


Figure 3.58: Plot of the chert and quartzite debitage from 5LA7351.

A total of 115 pieces of chipped-stone debitage were recorded from the site (Table 3.13). This represents all flakes visible on the surface at the time the site was recorded. Of the total, 61% is quartzite, 19% is chert, 8% is hornfels/basalt, 8% is obsidian, 3% is rock quartz, and 1% is argillite. Half of the quartzite is the large size grade and half is small; 40% of the debitage had cortex and 60% is noncortical; and 49% was recorded as complex flakes, 9% as shatter, and 43% as simple flakes. Of the chert debitage, 32% is large and 68% is small; 18% is cortical and 82% is noncortical; and 36% is classified as complex and 64% as simple.

Freehand percussion was the most important technique in generating the debitage (Figure 3.58). The quartzite debitage appears to have been generated in the early stages of lithic reduction, whereas the chert debitage seems to have been the result of late-stage reduction strategies. The sample size in the remaining materials is too small for adequate analysis.

The tool assemblage consists of eight artifacts. Three are bifaces, two are large bifacial core-tools, two are non-bipolar cores, and one is an end scraper. Material types for the cores and core-tools are quartzite (2), chert (1), and hornfels/basalt (1). The bifaces are made of fine-grained quartzite, obsidian, and coarse-grained quartzite. None appear to have been utilized and two of the three are classified as unfinished. The coarse-grained quartzite specimen is classified as nearly finished. The complete end scraper is classified as finished. It is made of Alibates chert. Heavy use wear and retouch modification is seen on the steep dorsal face on the distal end.

Two pieces of obsidian were submitted for sourcing from 5LA7351 (Appendix III). They came from different source areas within the Jemez Mountains. One specimen (5LA7351.0.14) came from the Polvadera Peak area of the northern Jemez Mountains and the other (5LA7351.0.10) is sourced to the Obsidian Ridge locale from the southern portion of the Jemez Mountains.

The ground-stone tools recorded from the site include two shallow basin metates made of sandstone. Both are broken, and the remains represent less than 50% of the complete pieces. In addition, three oval-shaped manos made of sandstone, one complete and two fragmentary, were found on the site surface.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7351 is a large site with high artifact count and density. Several temporally diagnostic artifacts were recovered, and a roasting pit (Feature 1) was recorded. The roasting pit and the relatively deep deposits indicate a high potential for finding datable buried deposits. The obsidian sourced to the Jemez Mountains of New Mexico and the Alibates chert scraper indicate that the inhabitants of the site may have been involved in a broad system of trade and exchange. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. The area in and around the roasting pit is a likely area to find buried cultural deposits.

This site is located on the western edge of the Black Hills in an area where several east-to-west trending small drainages dissect the slopes. The site is on a small ridge top that overlooks grassy plains to the west and north. Two small drainages cut into the site from the north. The 11.2-acre lithic scatter follows the small drainages down the slope to a relative flat area to the south (Figure 3.59). The site datum is at approximately 1,570 m (5,150 ft) asl, and the site elevations range from approximately 1,576 m (5,171 ft) to 1,567 m (5141 ft).

Even though no features were identified, three areas of rather dense chipped-stone debitage were recorded. Two of these were located near the western edge of the site. A core and a large, thin, patterned bifacial stone tool were recorded from the southernmost of these. An Alibates chert bifacial-thinning flake was located in this concentration. A third artifact concentration was found on the ridge top between the two drainages in the north-central part of the site. This area yielded a piece of obsidian, a large projectile point tip, a core, and a large biface fragment.

The dominant vegetation is juniper, with an understory of yucca, *Opuntias*, and various grama grasses. Soils are thin across the site, with some areas of exposed bedrock. The site is in fair condition, with erosion particularly noticeable along the drainages. Some intact deposits may be found near the southern edge of the site.

A total of 173 pieces of chipped-stone debitage were recorded from the site (Table 3.14). This represents a sample of the flakes seen on the surface at the time the site was recorded. Eight material types were noted. Of the total, 58% is quartzite, 29% is chert, 4% is basalt, 3% is obsidian, 3% is quartz, 1% is chalcedony, 1% is Alibates chert, and 1% is silicified wood. Of the quartzite flakes, 66% are the large size grade, while the remaining 34% are small; 36% of the debitage had cortex and 64% is noncortical; and 53% are simple flakes, 43% complex flakes, and 4% shatter. Of the chert debitage, 19% is large and 81% is small; 17% is cortical and 83% is noncortical; and 54% is classified as simple, 40% as complex, and 4% as shatter.

For the most part, freehand percussion generated the quartzite debitage (Figure 3.60). Given the relatively low percentage of cortical small flakes, it appears that some quartzite tool manufacture/maintenance and early-stage core reduction may also have occurred. The presence of a chert bifacial-thinning flake and the large number of small chert flakes indicate that some pressure flaking may have occurred and at least one biface was manufactured. A relatively high percentage of chert flakes exhibit cortex on the dorsal surface. Coupled with the number of small flakes, this indicates both early- and late-stage lithic reduction strategies were employed.

Two diagnostic projectile points were recovered from the site. One of these specimens (5LA7357.0.13) resembles Anderson's (1989) P35 type and has associated dates that range from 1000 B.C. to A.D. 1200. The second specimen is similar to the P59 type and has associated dates of from A.D. 500 to A.D. 1200. It is most likely that the site had at least one occupation that dates to the Early Ceramic stage (A.D. 200 to A.D. 800/1000), but an occupation extending back into the Late Archaic stage (1000 B.C. to A.D. 200) cannot be ruled out.

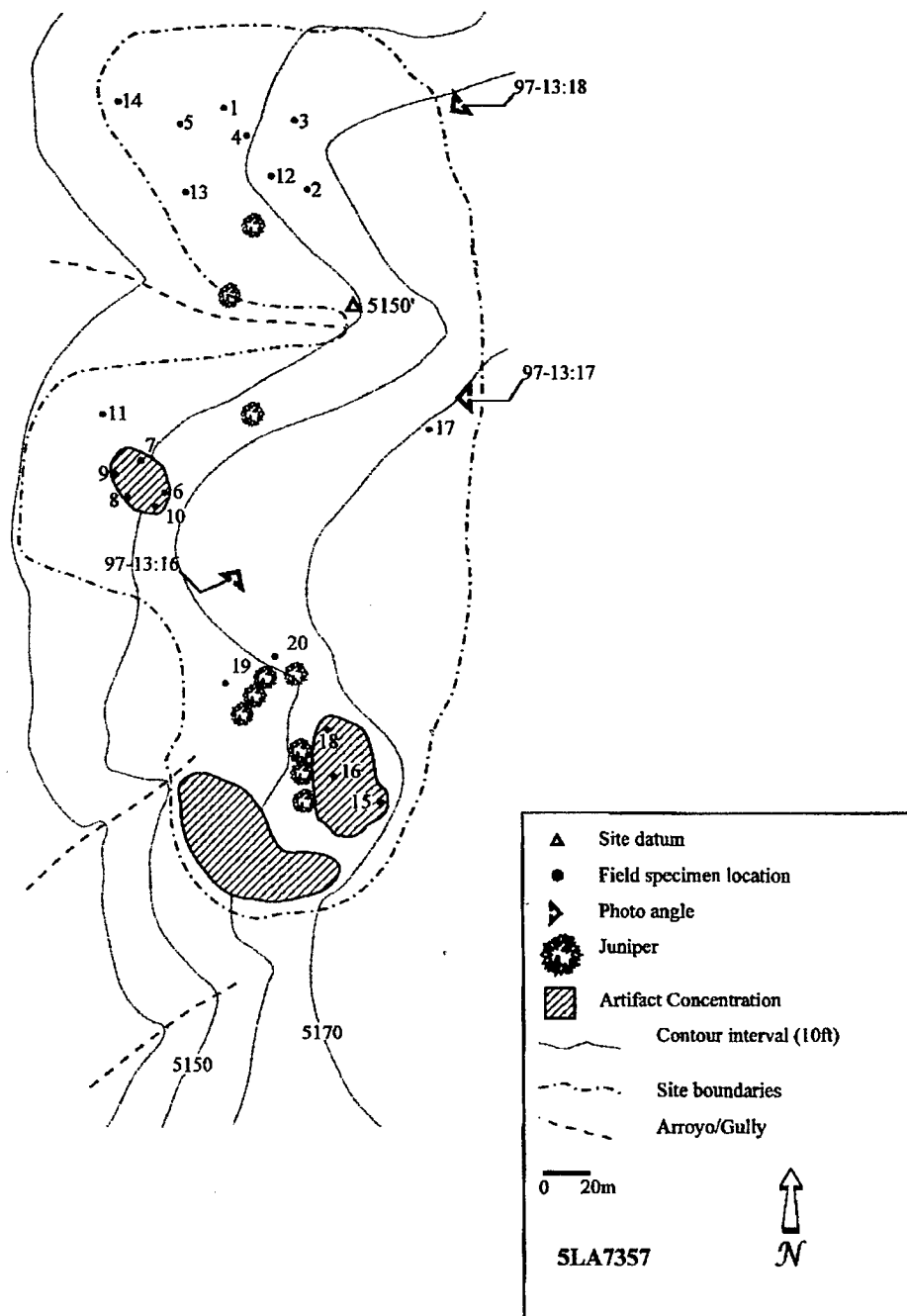


Figure 3.59: Site map, 5LA7357.

Table 3.14: Summary Description of Chipped-stone Debitage for 5LA7357.

	Alibates	Chalcedony	Chert	Hornfels/Basalt	Obsidian	Quartz	Quartzite	Silicified wood
Total flakes	1	1	52	8	5	5	100	1
Small	0	1	42	4	5	3	34	1
Large	0	0	10	4	0	2	66	0
Cortical	0	0	9	1	0	0	36	1
Noncortical	1	1	43	7	5	5	64	0
Simple	0	0	28	5	4	5	53	1
Complex	0	1	21	3	1	0	43	0
Shatter	0	0	2	0	0	0	4	0
Bifacial-thinning	1	0	1	0	0	0	0	0

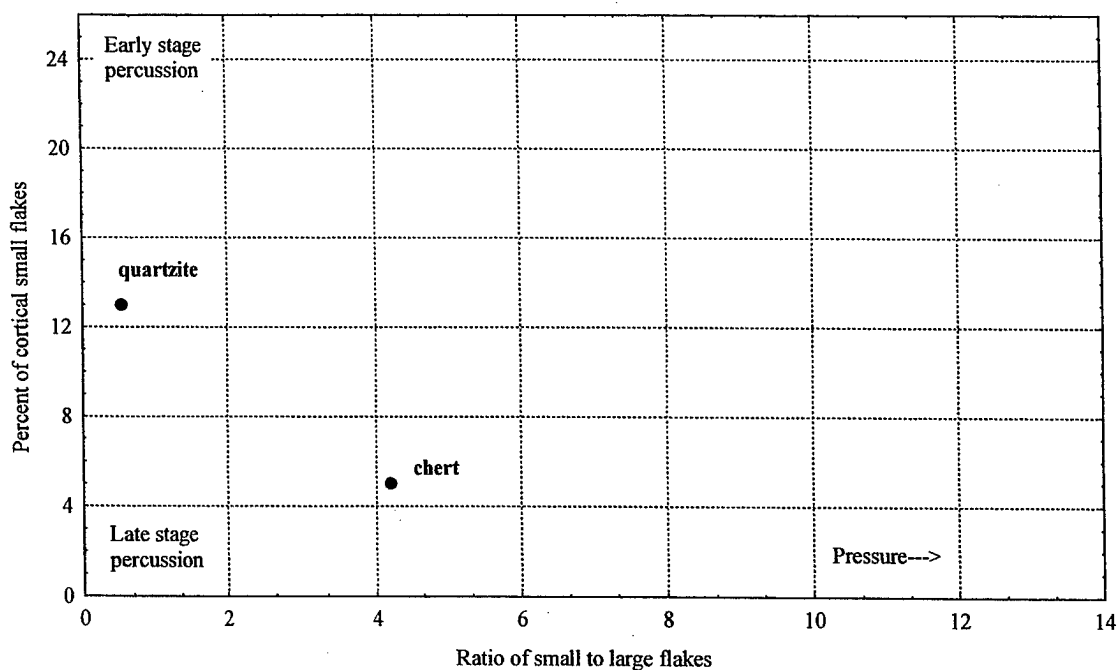


Figure 3.60: Plot of the chert and quartzite debitage from 5LA7357.

The stone-tool assemblage consists of three large core-tools, two non-bipolar cores, and two biface fragments. Two of the core-tools and both cores are quartzite. The remaining core-tool is chert. Both bifaces are coarse-grained quartzite. They were classified as nearly finished and display no visible use wear.

Three pieces of obsidian from this site were submitted for source analysis (Appendix III). Two (5LA7357.0.1 and 5LA7357.0.11) are sourced to the Cerro del Medio locale of the middle portion of the Jemez Mountains of New Mexico. The third specimen (5LA7357.0.7) is sourced to the Polvadera Peak locale in the northern portion of the Jemez Mountains.

A single shallow-basin metate was found in the eastern part of the site. What remains of it appears to be less than 50% of the original piece. This quartzite artifact exhibits both grinding and pecking on the utilized surface.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7357 is a large lithic scatter with a high artifact count and areas of high artifact density. Obsidian and Alibates chert were found, and the site has potential for answering questions about inter-regional contacts. The presence of temporally diagnostic artifacts may aid research designed to refine the regional chronology. Although no surface fire features were noted, there are areas (perhaps in the southwestern part of the site) which are believed to contain intact subsurface remains. The presence of ground stone may indicate the presence of pollen and/or macrobotanical remains that, if located, would aid in the reconstruction of subsistence patterns. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. The areas around the artifact concentrations should be examined to determine the likelihood of subsurface deposits.

5LA7365

This lithic scatter, procurement and multiple structure site is located on one of several narrow north-south trending ridges along the northern portion of the project area. These ridges were created through the erosional effects of large stream channels that help drain water from the Black Hills into the main branch of Stage Canyon. The site occupies a low knoll and its adjacent slopes near the canyon edge. The artifact distribution is fairly extensive; the boundary measures approximately 4.5 acres (Figures 3.61 and 3.62). Artifact density is highest in the immediate vicinity and just northwest of the site datum. The datum is at an elevation of approximately 1,576 m (5,170 ft) asl. The knoll around which the site is found drops off another 3-5 m. The site does not seem to extend down the sides of the canyon wall.

Juniper is sparse at the site, but the *Opuntias*, yucca, foxtail, and grama grasses are common. Soils are thin near the canyon rim and at the top of the knoll; however, relatively thick deposits (up to ca. 25 cm) were noted in the southern portion of the site and some deposition was noted in the remains of the structures.

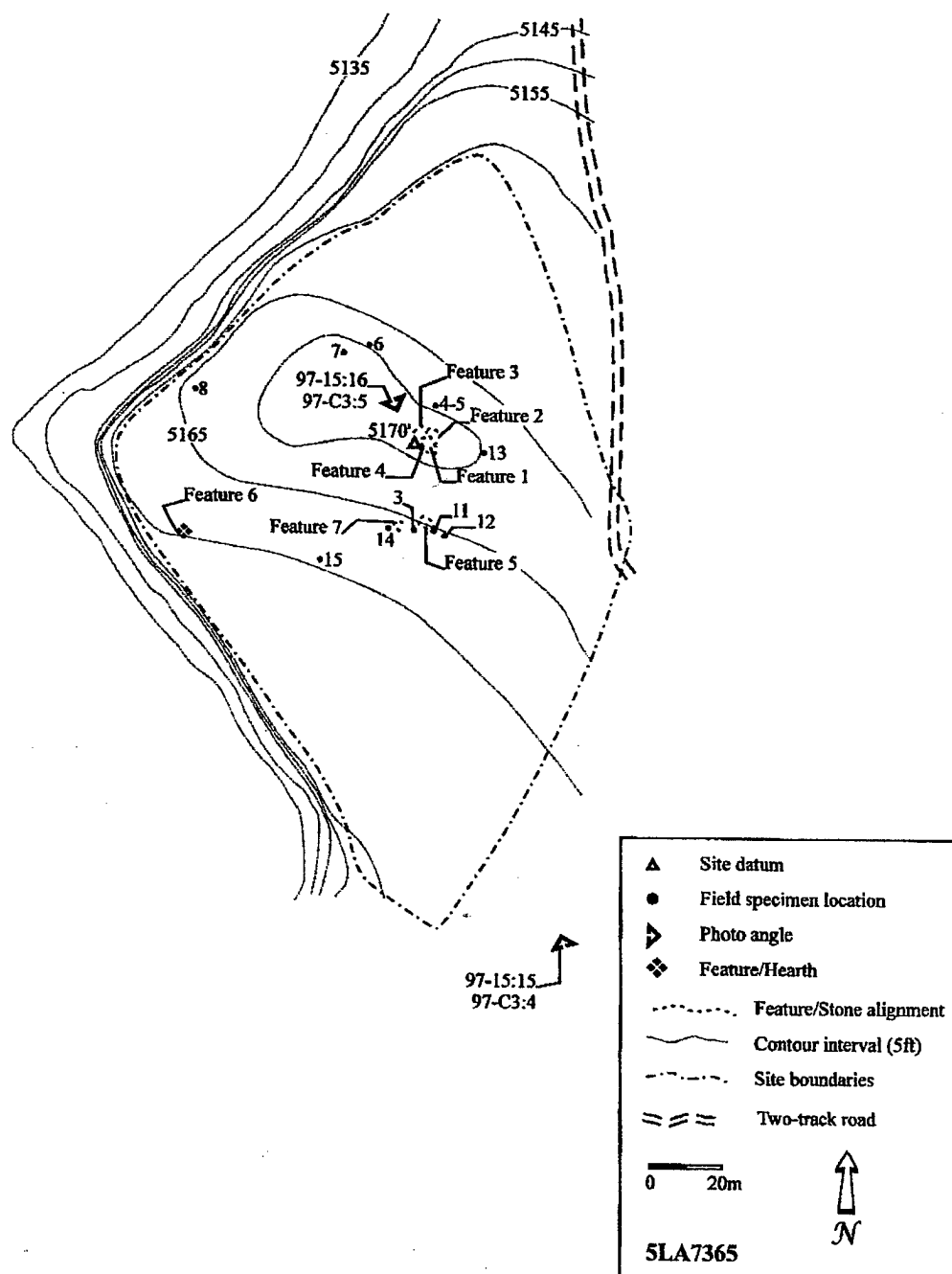


Figure 3.61: Site map, 5LA7365.

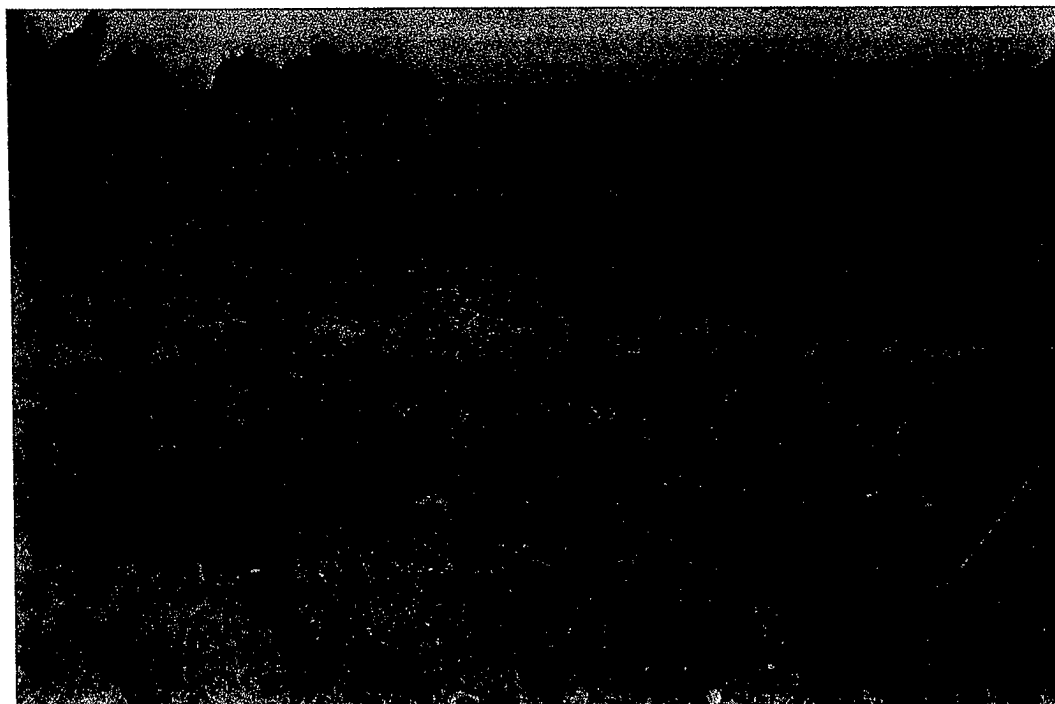


Figure 3.62: Overview of Site 5LA7365 with Feature 5 (stone circle) in foreground. Tape in lower right corner points north.

The presence of several structures is the most distinctive characteristic of the site. A total of seven features were recorded, and five of these are likely structures or rooms to structures. A single, multi-room structure is located just north and northeast of the site datum (Figure 3.63). This structure appears to be composed of at least three circular rooms each made of alignments of native sandstone. Rooms were assigned separate feature numbers. Feature 1 is the largest of the rooms, with a maximum outside diameter of approximately 6 m. Feature 2 is approximately 2 m, and Feature 3 is 2.5 m in diameter. A stone pile between Features 1 and 3 was designated as Feature 4, but it appears that this group of rocks is simply the rubble from the walls of the two closely spaced rooms. Fragments of burned bone were noted along the eastern side of Feature 1. Artifacts appear to be eroding out of the structures. According to Kalasz's (1989:108) typology, the structures are Class VI agglutinated rock wall units. These architectural features have associated radiocarbon dates that extend from the Early to the Middle Ceramic Stage.

Two other structures were also recorded at the site. Feature 5 (Figure 3.64) is a single-room, isolated circular structure measuring approximately 4 m outside diameter. This feature had a small amount of burned bone in close association. According to Kalasz (1989:102), Feature 5 is a Class V contiguous rock wall and isolated unit. These architectural features are associated with dates from approximately A.D. 270 to A.D. 1360.

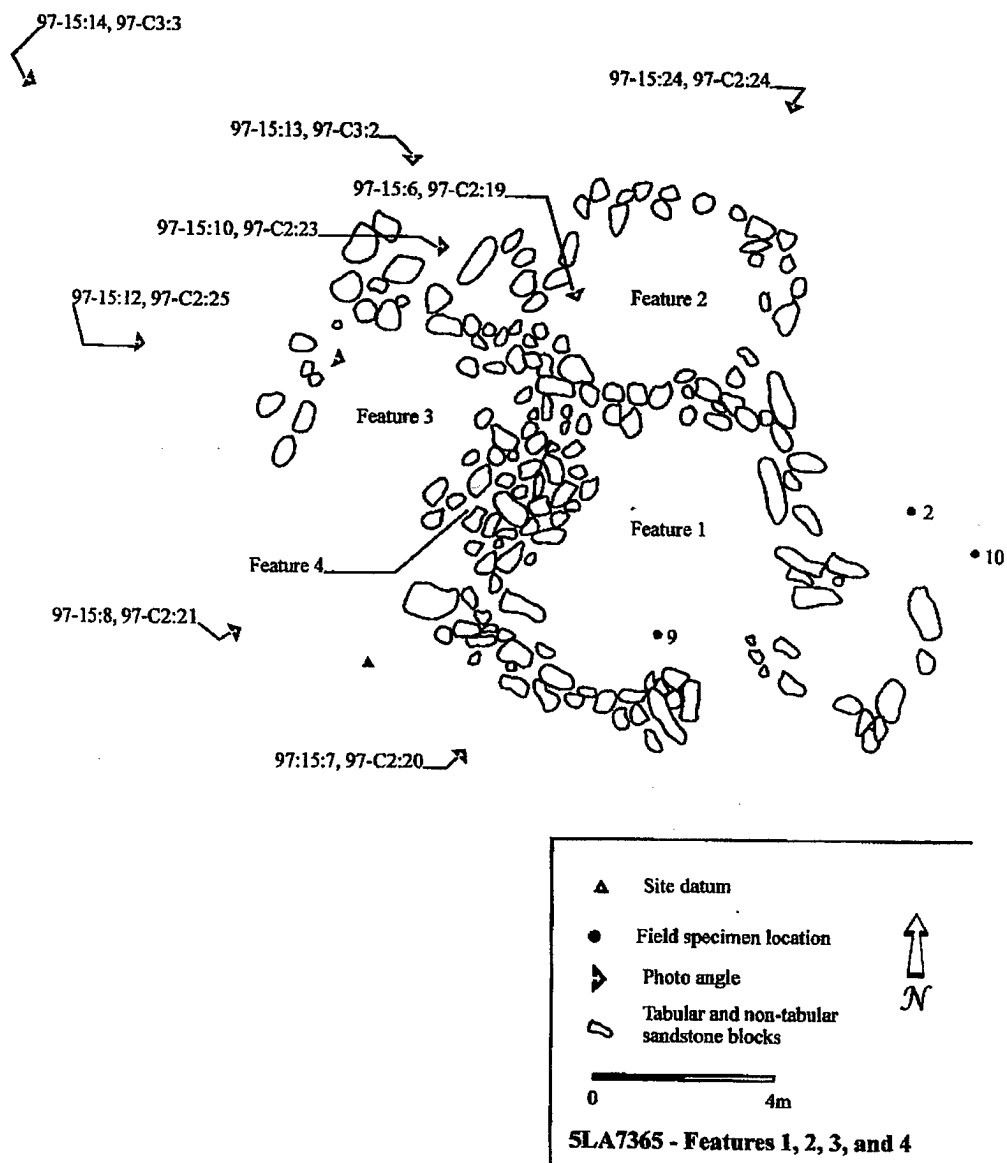


Figure 3.63: Planview of Features 1-4, 5LA7365.

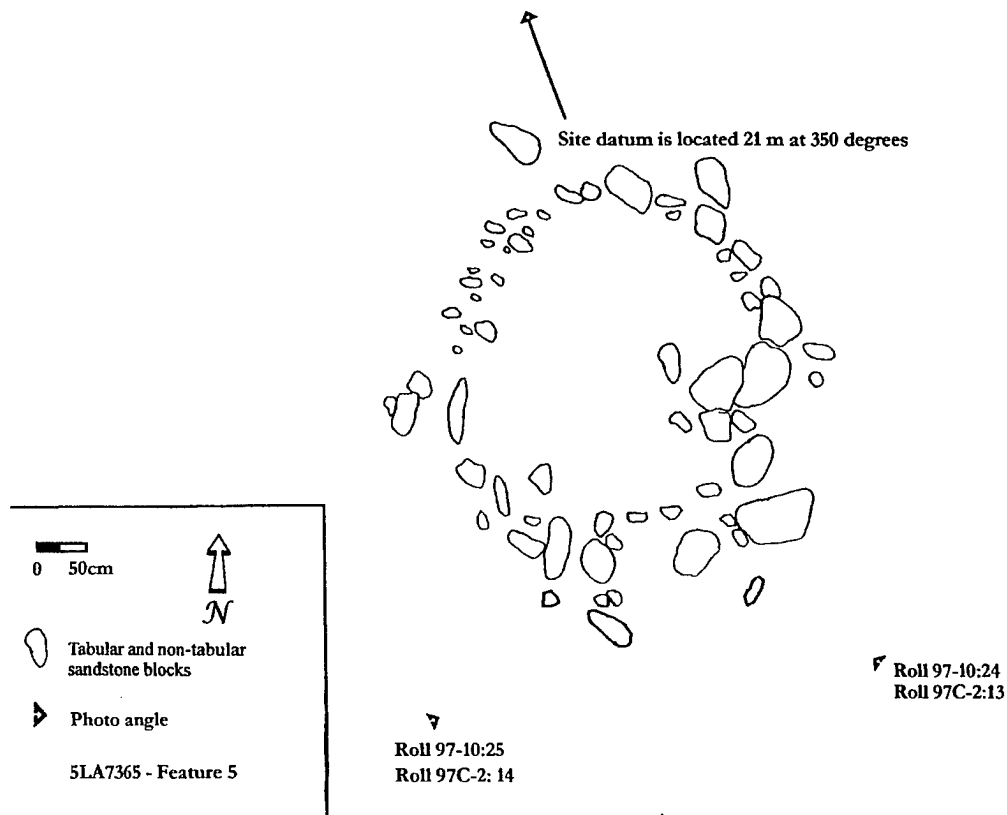


Figure 3.64: Planview of Feature 5, 5LA7365.

Feature 6 is located in the western part of the site and is a rather simple stone cairn measuring approximately 0.85 m in maximum, outside diameter. This feature is somewhat indistinct and may even be historic rather than prehistoric. Since no artifacts were noted in direct association, its function remains unknown.

Feature 7 is perhaps the most problematical of the structures identified during the fieldwork (Figure 3.65). The shape of the structure is difficult to determine, given its present condition, but it may be circular or rectangular. What remains of the structure indicates a width of at least 3 m.

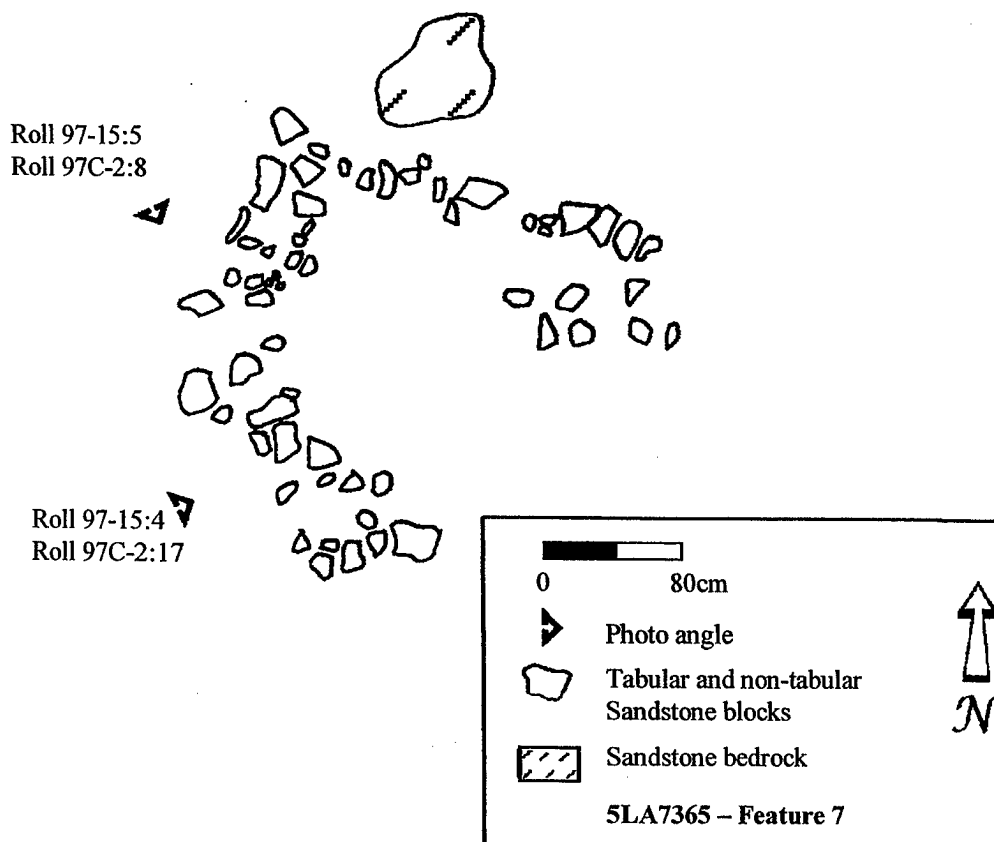


Figure 3.65: Planview of Feature 7, 5LA7365.

A total of 210 pieces of chipped-stone debitage were recorded from the site (Table 3.15). Only three material types are noted, which is a relatively narrow range. Quartzite far outnumbers the other materials with 96% of the total; only 3% of the flakes were chert, with a single flake of chalcedony. Of the quartzite debitage, 76% is the large size grade, while the remaining 24% is small; 23% of the debitage has cortex and 77% is noncortical; and 69% is recorded as simple flakes, 21% as complex flakes, and 10% is shatter. The total number of chert flakes is too low (7) for adequate analysis, but of the chert flakes, 71% is large and 29% is small; 57% is cortical and 43% is noncortical; and 14% is classified as simple, 14% as complex, and 71% is shatter. The high proportions of shatter and cortical chert flakes indicate a tendency toward the earlier stages of lithic reduction for chert.

Figure 3.66 shows a scatter plot of quartzite. For the most part, it appears freehand percussion was likely the most important technique in generating the quartzite debitage. The relatively low percentage of cortical small flakes suggest that some quartzite later stage lithic reduction activities may have taken place at the site. However, the high percentage of shatter (20%) indicates that perhaps core reduction or cobble testing was also an important activity. The dominance of quartzite is apparently related to an outcrop of high-quality native stone suitable for tools eroding from the canyon edge at the southwest corner of the site. Broken chunks of quartzite suggest the possibility of procurement at this location.

Table 3.15: Summary Description of Chipped-Stone Debitage for 5LA7365.

	Chalcedony	Chert	Quartzite
Total flakes	1	7	202
Small	1	2	49
Large	0	5	153
Cortical	1	4	46
Noncortical	0	3	156
Simple	1	1	140
Complex	0	1	42
Shatter	0	5	20
Bifacial-thinning	0	0	0

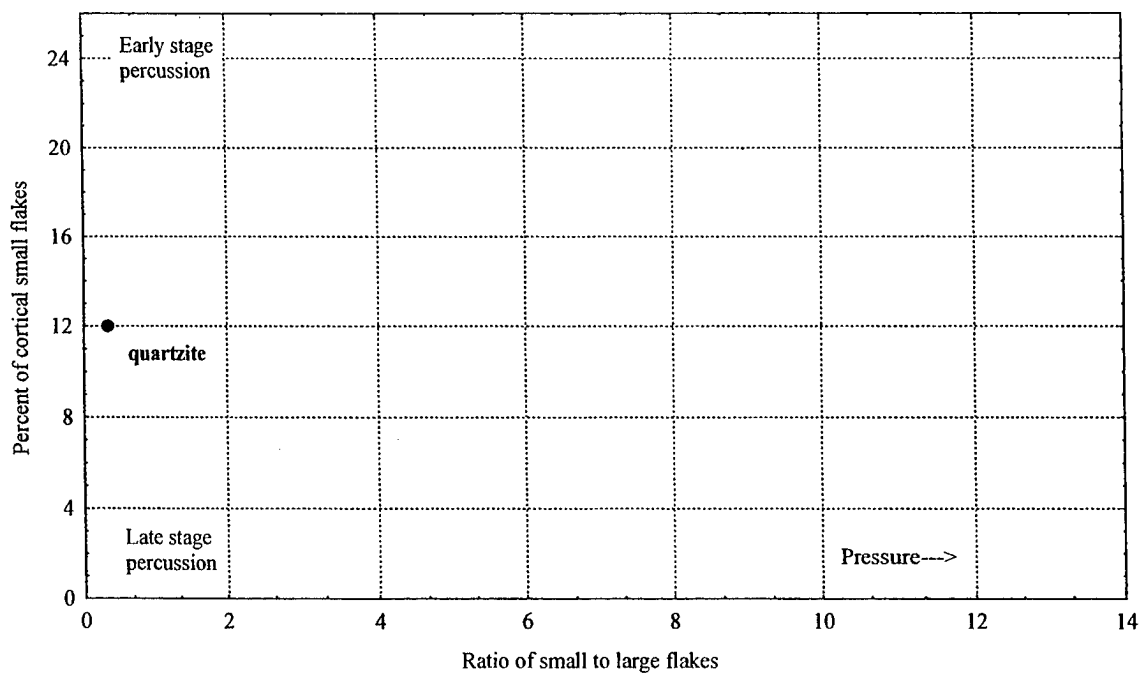


Figure 3.66: Plot of the quartzite debitage from 5LA7365.

Three sandstone tools were noted on the surface. They include a broken mano with an ovoid shape, a broken rectangular metate with pecking and grinding, and a complete, rectangular metate with a shallow basin that exhibits evidence of both pecking and grinding. No striations were noted on any of the ground-stone artifacts.

Nine specimens comprise the tool assemblage. All are made of quartzite. Of these, four are bifacial core-tools, two are bifaces, one is a non-bipolar core, one is a uniface tool, and one is a retouched flake. Both biface tools are complete and were classified as one unfinished and one nearly finished biface. Both show bifacial modification, but only the nearly finished specimen exhibits light cutting (< 45-degree) use wear. The uniface tool fragment is classified as unfinished due to light retouch modification and the lack of use wear. The utilized flake specimen is complete and exhibits light scraping wear on the steep dorsal face of the left lateral edge.

We recommend that this site be determined to be eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7365 is a large lithic scatter, procurement area and structure site with a high artifact count and areas of high artifact density. The presence of several temporally diagnostic artifacts may aid in research designed to refine the regional chronology. The presence of at least two structures (one of which is composed of at least three rooms) will allow research to address issues regarding the settlement system at the PCMS. It is also likely that the deposits within the structures will yield intact buried deposits. This potential, along with the presence of ground stone, suggests the presence of pollen and/or macrobotanical remains. A two-track access road currently cuts through the western edge of the site, making it particularly susceptible to damage. The site was fenced for its protection shortly after it was recorded. Nonetheless, we suggest that it be revisited for more detailed mapping and a more thorough surface collection. Areas where there is potential for locating subsurface cultural deposits should be test excavated.

5LA7383

This lithic scatter and multiple rockshelter site is located on the western edge of a narrow ridge oriented north-south. The ridge is flanked by the drainages of two unnamed streams that flow north to Stage Canyon. The rockshelters are off the ridge top facing westward across a narrow canyon. Chipped-stone debitage and tools are located on the talus slopes in front of the shelters as well as on top of the ridge extending to the east (Figure 3.67). The site occupies approximately 1.4 acres. Datum is at an elevation of approximately 1,579 m (5,180 ft) asl.

The site is in the juniper scrub vegetative community typical to the Black Hills. Yucca, grama grasses, foxtail, and the *Opuntias* grow with the juniper on the site. The soils on top of the ridge are thin and range from exposed bedrock to only about 10 cm in depth.

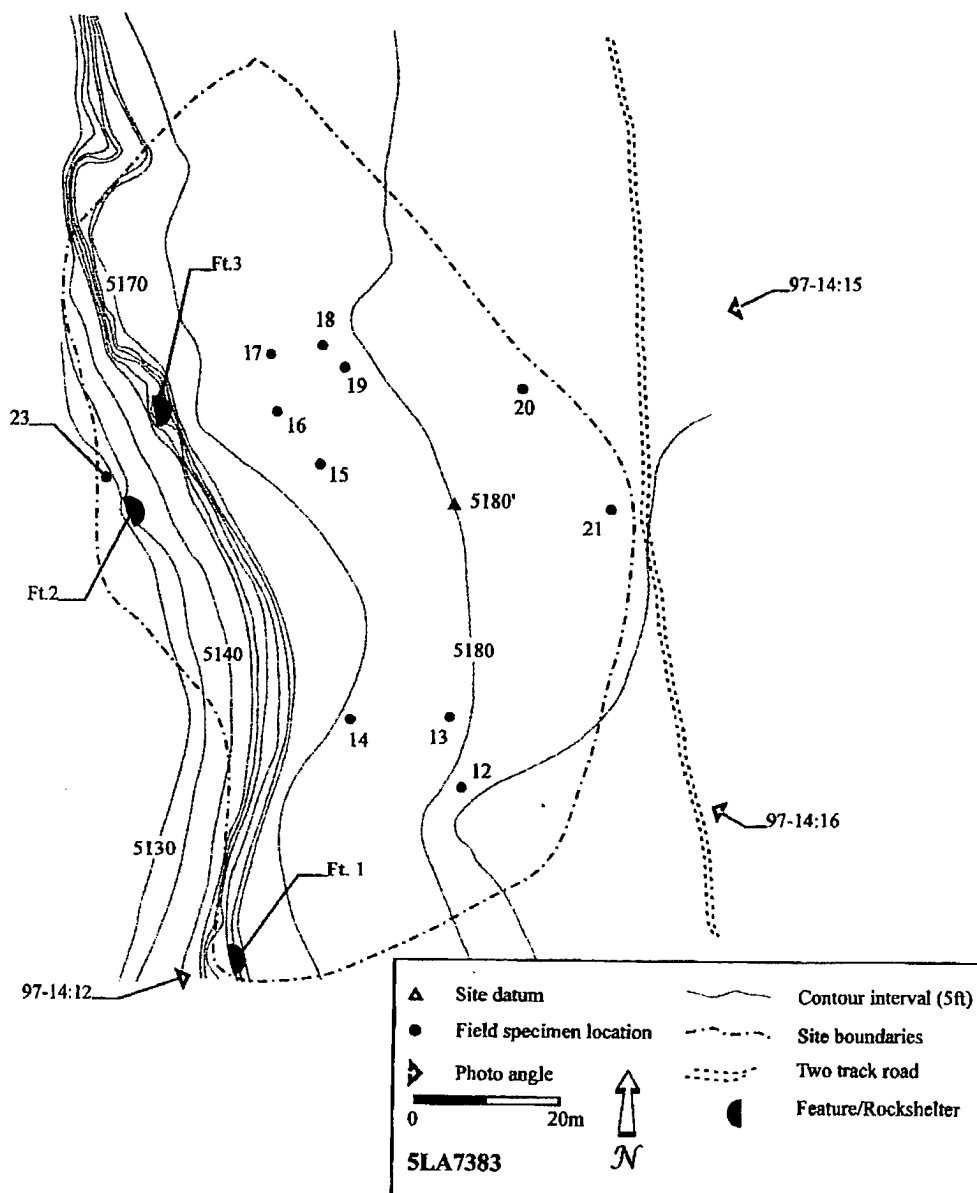


Figure 3.67: Site map, 5LA7383.

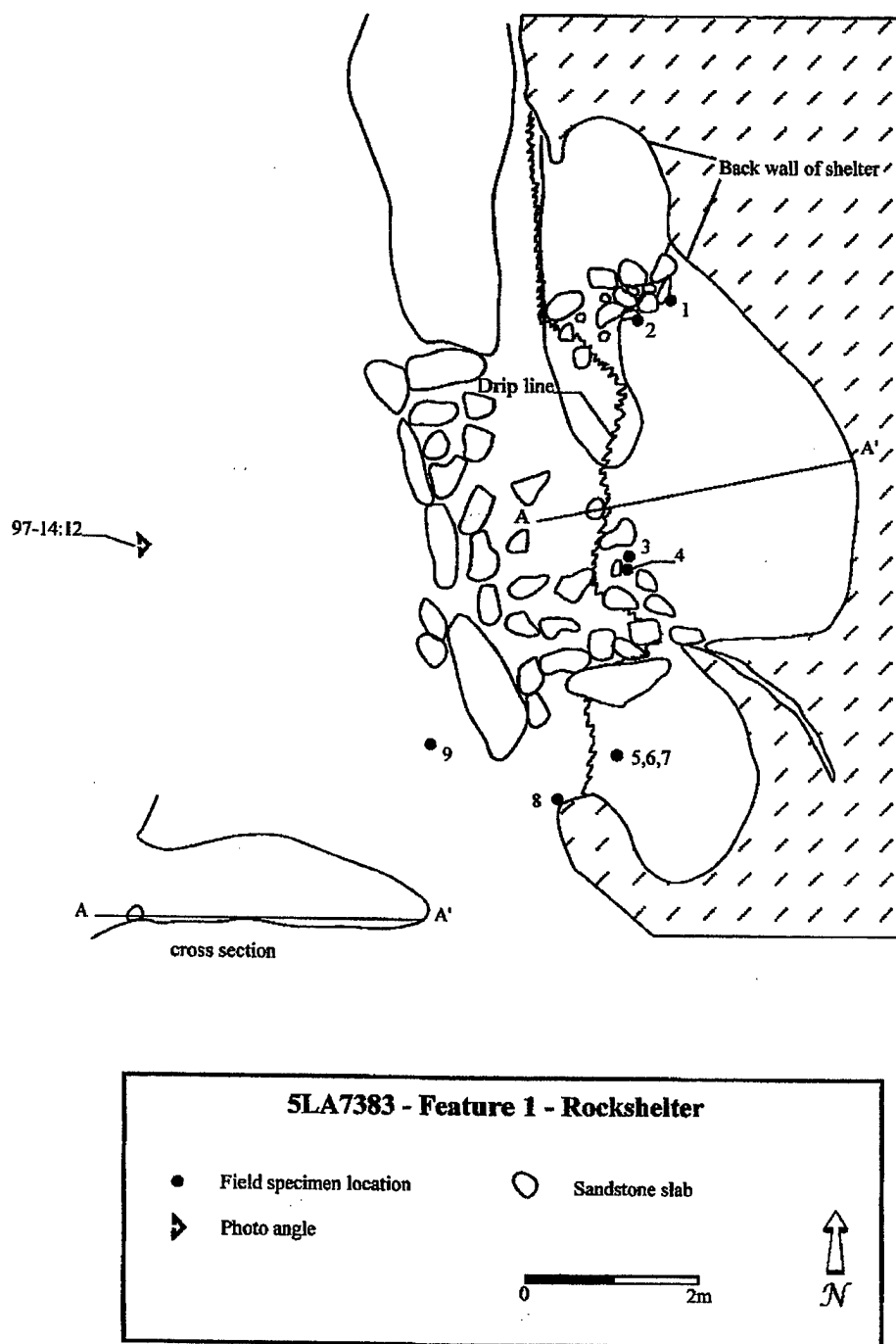


Figure 3.68: Planview and Cross-section of Feature 1, 5LA7383.

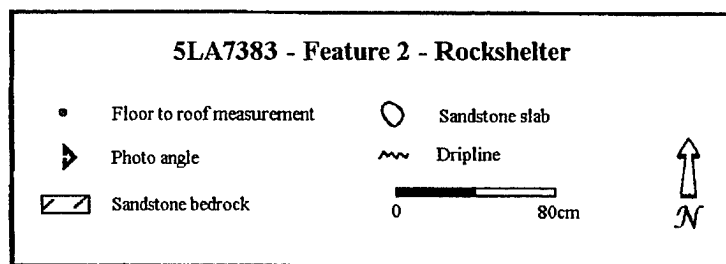
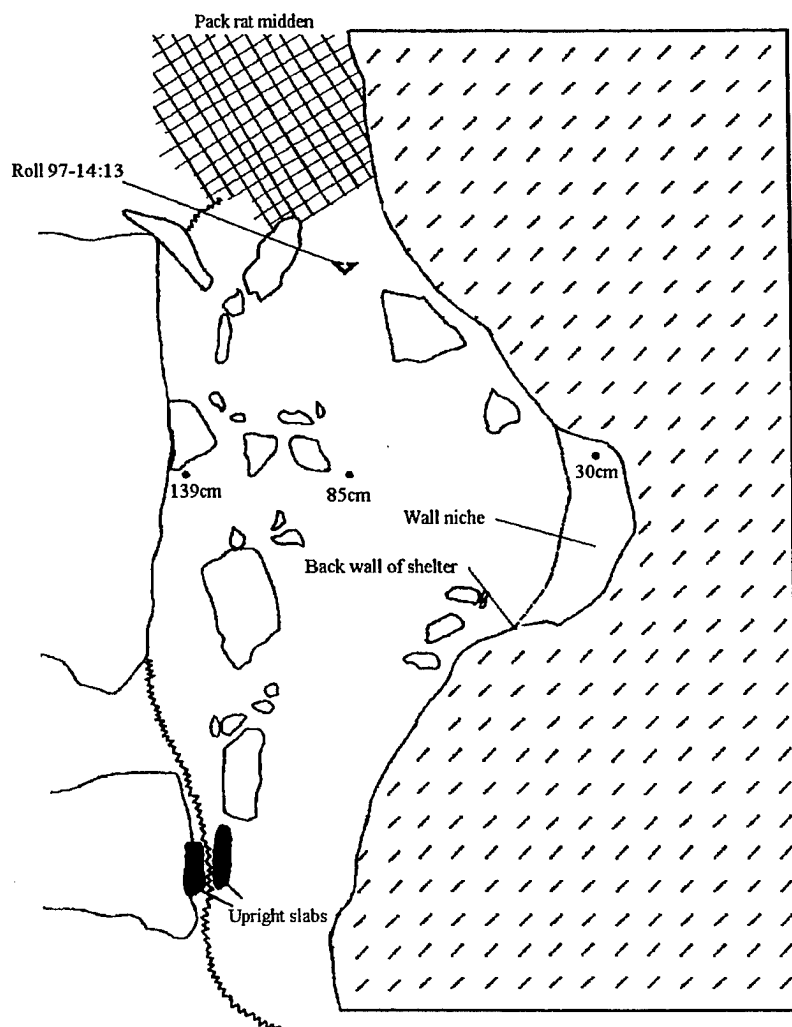


Figure 3.69: Planview of Feature 2, 5LA7383.

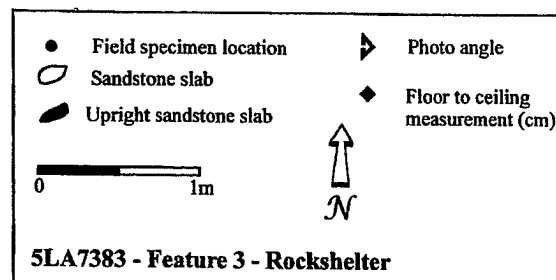
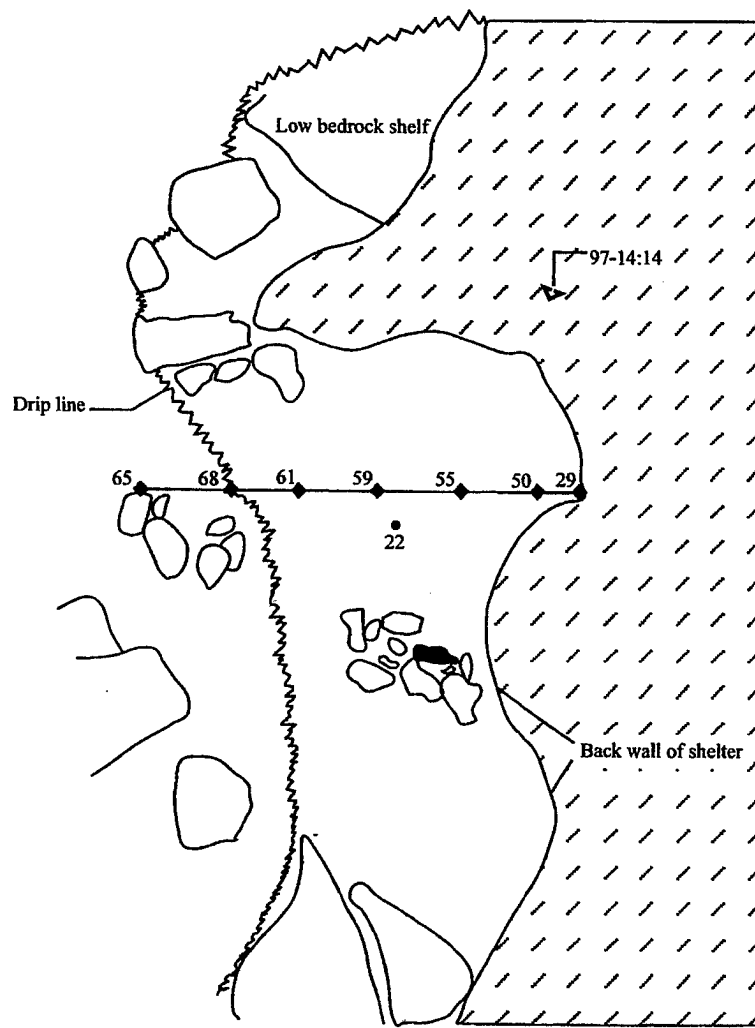


Figure 3.70: Planview of Feature 3, 5LA7383.

Three rockshelters were recorded at the site. Shelters 2 and 3 are located in close proximity to one another. Shelter 2 measures 5 m across the opening by 2.4 m from the back of the shelter to the drip line. This shelter may have a rock alignment that parallels the drip line. Two upright sandstone slabs are located near the northern edge of the opening (Figure 3.69). Shelter 3 measures 4.25 m across the opening by 2.25 m from the back of the shelter to the drip line. A short rock alignment with a single upright sandstone slab is present in the center of the shelter (Figure 3.70). Shelter 1 is located about 60-70 m to the south. It has an opening that is 8.5 m across and 3 m from the back to the drip line (Figure 3.68). Shelter 1 has about 50 cm of deposition and a relatively high proportion of ground stone, including Field Specimens (FS) 1 and 2 which form part of the interior wall. There is also a thin scatter of artifacts down the talus slope in front of Shelter 1.

A total of 93 pieces of chipped-stone debitage were recorded from the site (Table 3.16). Four material types were noted. Of the total, 78% is quartzite, 18% is chert, 2% is argillite, and 1% is hornfels/basalt. Of the quartzite debitage, 78% falls into the large size grade, while the remaining 22% is small; 36% of the debitage has cortex and 64% is noncortical; 74% is recorded as simple flakes, 14% as complex flakes, and 12% as shatter. Of the chert debitage, 47% is large and 53% is small; 41% is cortical and 59% is noncortical; and 35% is classified as simple, 29% as complex, and 35% as shatter.

Figure 3.71 shows a scatter plot of both quartzite and chert debitage. It appears that freehand percussion generated both the chert and quartzite debitage, although it should be noted that the sample size for the chert debitage is somewhat small (17). The plot for quartzite is radically different from the previously presented plots. Interestingly, of the 17 small quartzite flakes, none are cortical; however, 12% of the debitage is classified as shatter. These values are somewhat ambiguous; the overall quartzite assemblage appears to have been generated by an early reduction strategy, but the lack of cortical, small flakes also suggests some later stage reduction activities. Even though the chert sample size is small, the flakes suggest early-stage reduction activities.

The tool assemblage consists of three non-bipolar cores, two uniface flake tools, one biface, one end/side scraper, and one utilized flake. Chert (2) and coarse-grained quartzite (1) represent the material types for the cores. Both uniface tool fragments are quartzite. The fine-grained specimen is classified as unfinished with no use wear. The coarse-grained specimen is classified as nearly finished and displays light use wear along one acute lateral edge. The biface is complete and made of chert. This unfinished specimen exhibits distinct bifacial modification and no obvious use wear. The chert end/side scraper shows light to heavy use wear on both lateral edges and the distal end. The reduction stage for this complete tool is finished. The utilized flake is broken and made of argillite. Light scraper use wear is seen along the remaining portion of the acute edge.

Ten pieces of ground stone were recorded at the site. Seven of these were found in Shelter 1. Two of these pieces (FS 1 and 2) are incorporated into the construction of the interior wall of the shelter. Both are sandstone metates that exhibit evidence of grinding and pecking. FS 1 is whole and measures 53 x 25 x 7.5 cm, and the grinding surface measures 25 x 12 cm. FS 2 is less than 50% complete and has an extant grinding surface that measures 15 x 5 cm.

Table 3.16: Summary Description of Chipped-Stone Debitage for 5LA7383.

	Argillite	Chert	Hornfels/Basalt	Quartzite
Total flakes	2	17	1	73
Small	0	9	0	17
Large	2	8	1	56
Cortical	0	7	1	26
Noncortical	2	10	0	47
Simple	1	6	1	54
Complex	1	5	0	10
Shatter	0	6	0	9
Bifacial-thinning	0	0	0	0

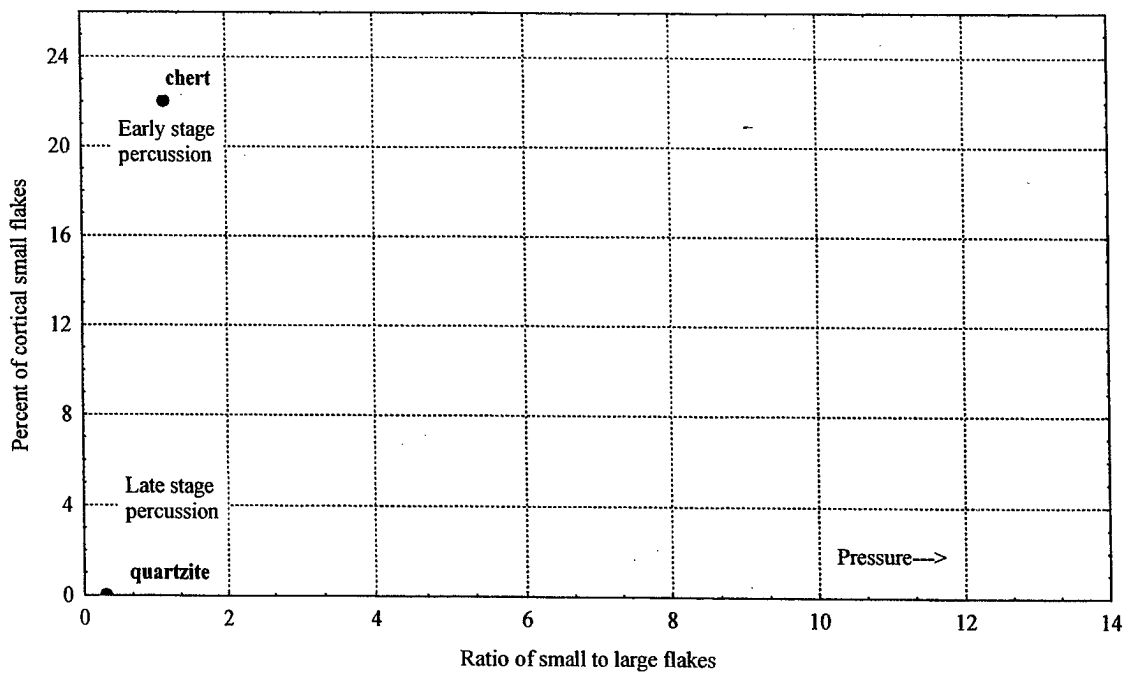


Figure 3.71: Plot of the chert and quartzite debitage from 5LA7383.

Five additional pieces of ground stone were found in the shelter. FS 3 is a mano with two grinding surfaces (13 x 6.5 x 5 cm). FS 4 is a shallow basin metate that has evidence of both grinding and pecking and longitudinal striations. The extant piece measures 29 x 20.5 x 5.5 cm. FS 5 is a broken sandstone mano with two grinding surfaces. The entire artifact measures 10 x 3 x 4.2 cm and exhibits multiple striations on one side and longitudinal striations on the other. FS 6 is a complete sandstone mano with longitudinal striations and measures 11 x 8 x 3.5 cm. FS 7 is a broken, flat metate measuring 5.2 x 5.2 x 1.7 cm. Striations on this piece are difficult to discern. The remaining three pieces of ground stone are one metate and two manos. FS 11 is a flat metate measuring 4.9 x 2.7 x 1.6 cm. FS 14 and 16 are both broken manos. FS 14 has two grinding surfaces and shows evidence of grinding and pecking. The extant piece measures 9 x 8.5 x 4.5 cm. FS 16 is made of quartzite and measures 6.5 x 4.5 x 1.

Site 5LA7383 is a large lithic scatter and rockshelter site with a high ground-stone count and areas of high artifact density. The presence of numerous pieces of ground stone in Shelter 1 indicates that plant processing was carried out in or around the shelter. The presence of at least 50 cm of deposition in the shelter also suggest a good probability of finding intact cultural deposits that would include pollen and macrobotanical remains. Test excavations in Shelter 1 could easily provide important data for the reconstruction of subsistence patterns and/or paleoenvironment. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Shelter 1 appears to have good potential for encountering intact, cultural deposits through test excavation. We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D).

5LA7400

The site is located on the western edge of the project area in an area of heavily dissected northeast-southwest trending drainages. The site is situated between two drainages and on the east side of a two-track road. The lithic scatter is large, measuring 500 m by 400 m, and it extends up most of the west edge of the Black Hills (Figures 3.72 and 3.73). Lithics seem to extend to the juniper overstory but not beyond. Three areas of somewhat higher lithic density were noted, but not recorded as separate features. The area in the southeast part of the site is the largest. It contained seven chipped-stone tools including two projectile points (FS 19 and 25). No chipped stone tools were noted within the other two areas. The site datum is at approximately 1,570 m (5,100 ft) asl and the site drops in elevation an additional 25 m toward the south.

The site is in the juniper scrub vegetative community typical of the Black Hills. In addition to juniper, grama grasses and the *Opuntias* were seen on the site. The soils are generally thin (ca. 5-10 cm); however, areas of greater deposition are found on the southeast part of the site. Along the bottom of the slope, the deposition increases.

A total of 193 pieces of chipped-stone debitage were recorded (Table 3.17). Eight material types were noted, which is a wide range for sites in the western portion of the project area. Of the total, 52% is quartzite, 34% is chert, 7% is silicified wood, 3% is chalcedony, 3% is obsidian, 1% is hornfels/basalt, and quartz and exotic chert are each less than 1%.

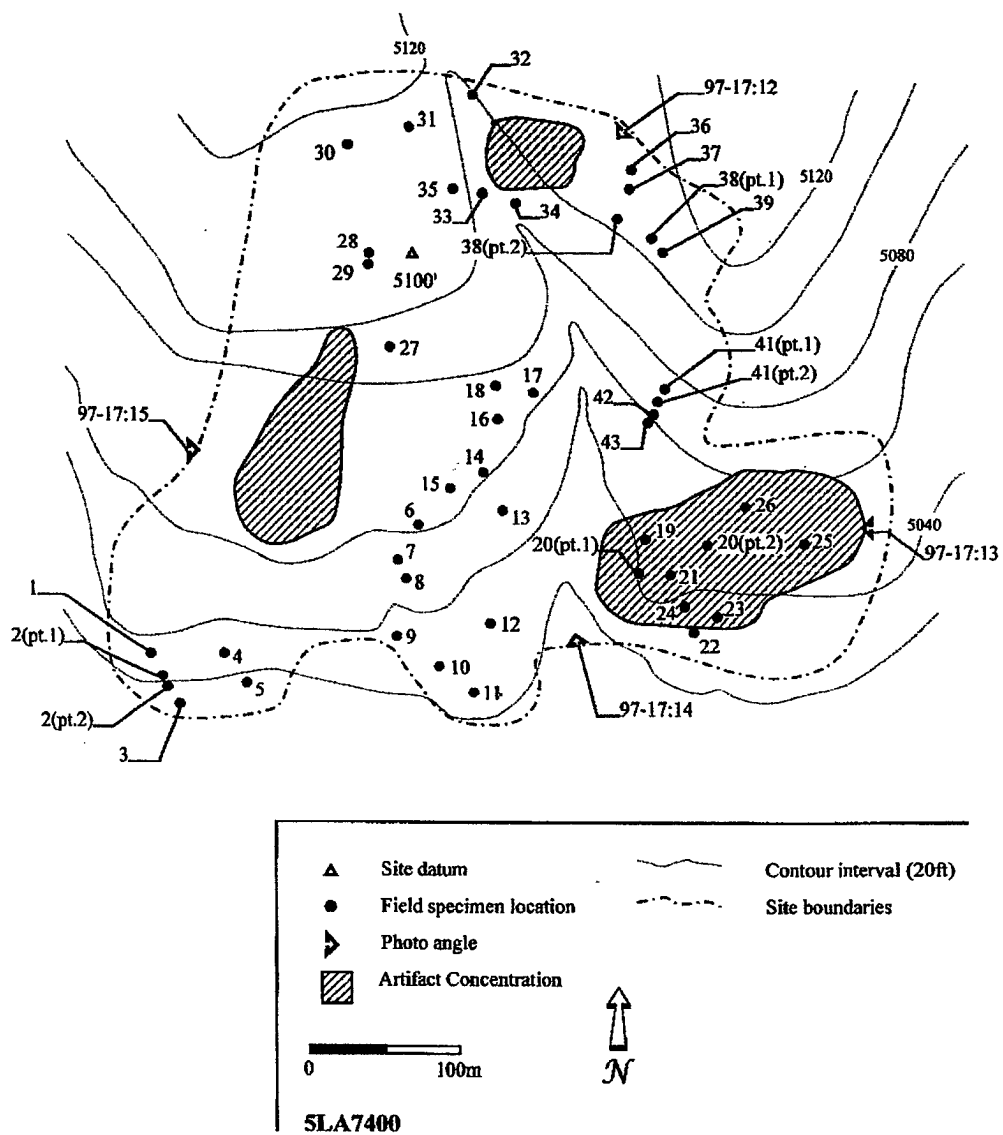


Figure 3.72: Site map, 5LA7400.

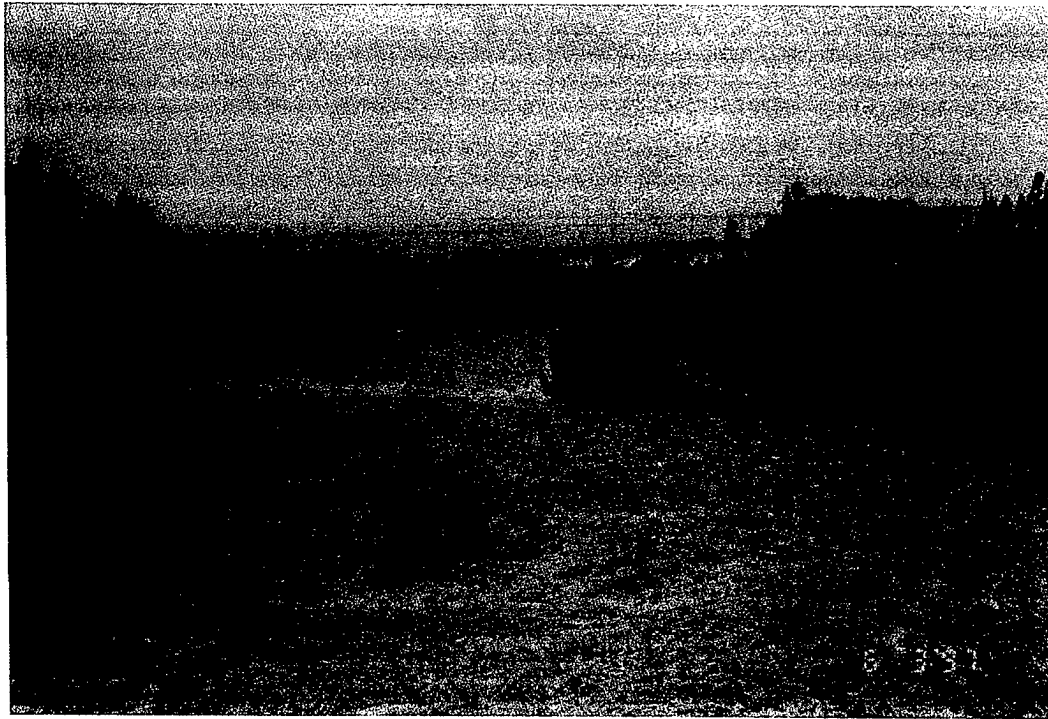


Figure 3.73: Photograph of Site 5LA7400.

Of the quartzite debitage, 63% is the large size grade, while the remaining 37% is small; 38% of the debitage has cortex and 62% is noncortical; and 57% is recorded as simple flakes, 42% as complex flakes, and 1% as shatter. Of the chert debitage, 28% is large and 72% is small; 15% is cortical and 85% is noncortical; and 43% is classified as simple, 54% as complex, 2% as shatter, and another 2% as bifacial-thinning flakes.

For the most part, freehand percussion generated the quartzite debitage (Figure 3.74). Given the relatively high percentage of cortical, small flakes, it appears that core reduction was the main lithic reduction strategy that generated most of the quartzite debitage. The presence of a chert bifacial-thinning flake and the large number of small, chert flakes indicate that some pressure flaking may have occurred at the site.

A relatively high percentage of chert flakes are cortical. This pattern, coupled with the number of small flakes, indicates both early- and late-stage lithic reduction. Even though the count for silicified wood is low (14), the presence of two bifacial-thinning flakes, a lack of cortical flakes, and the high percentage of complex flakes suggests late-stage lithic reduction activities.

Three pieces of obsidian (5LA7400.0.23, 5LA7400.0.26, and 5LA7400.0.33) were recovered from the site. The three pieces were submitted for sourcing (Appendix III) and found to come from the Polvadera Peak source area of the Jemez Mountains of New Mexico. Another obsidian projectile point was recovered at the site, but it was not submitted for sourcing.

Table 3.17: Summary Description of Chipped-Stone Debitage for 5LA7400.

	Chalcedony	Chert	Exotic chert	Hornfels/basalt	Obsidian	Quartz	Quartzite	Silicified wood
Total flakes	6	65	1	2	3	1	101	14
Small	4	47	0	0	3	0	37	6
Large	2	18	1	2	0	1	64	8
Cortical	5	10	0	0	0	0	38	0
Noncortical	1	55	1	2	3	1	63	14
Simple	4	28	0	1	3	1	58	4
Complex	2	35	1	0	0	0	42	8
Shatter	0	1	0	0	0	0	1	0
Bifacial-thinning	0	1	0	1	0	0	0	2

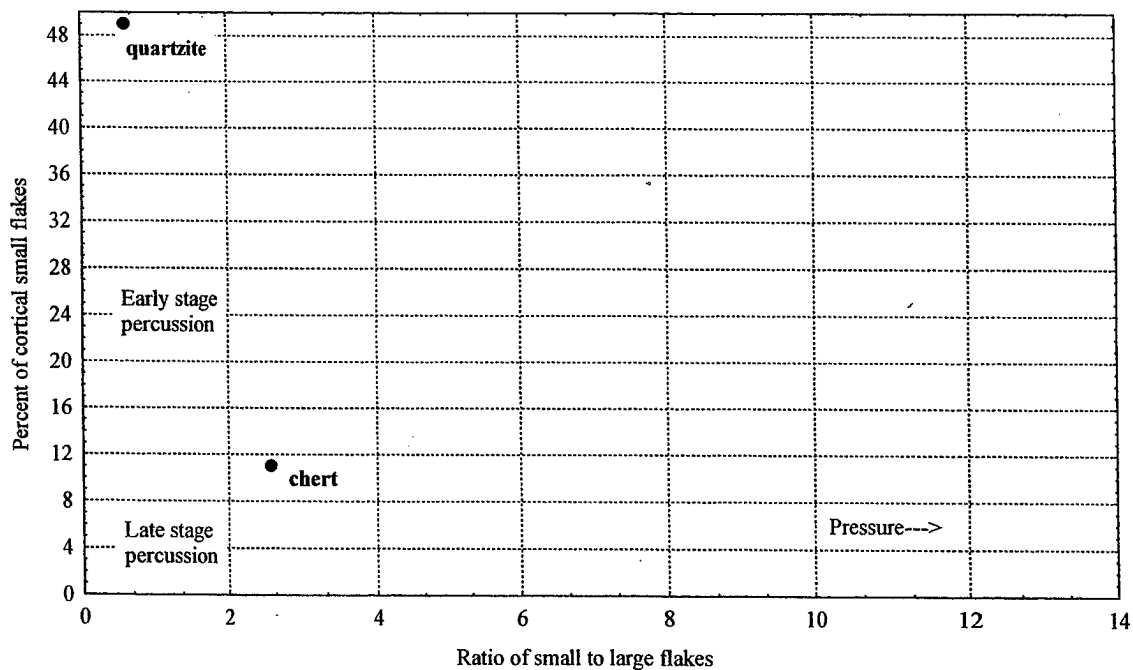


Figure 3.74: Plot of the quartzite and chert debitage from 5LA7400.

Six temporally diagnostic projectile points were recovered from the site (Figure 3.75). Two of these specimens (5LA7400.0.9 and 5LA7400.0.13) resemble Anderson's (1989) P25 type, which dates from approximately 1500 B.C. and 1000 B.C. These two projectile points suggest a Middle Archaic stage (3000 B.C. to 100 B.C.) occupation of the site. The remaining four projectile points (5LA7400.0.7, 5LA7400.0.19, 5LA7400.0.12, and 5LA7400.0.32) have associated dates that extend from the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500) to the Late Ceramic stage (A.D. 1500 to A.D. 1750).

The stone-tool assemblage of 23 artifacts consists of nine bifaces, six scrapers, three cores, three uniface tools, one bifacial core-tool, and one drill (5LA7400.0.15). Because the cores and core-tools were analyzed in the field, only the material type was recorded. The core specimens are made of chert, and the core-tool is coarse-grained quartzite.

Of the bifaces, seven of the nine specimens are broken. The majority consists of fine-grained quartzite (4), with chert (3), hornfels/basalt (1), and coarse-grained quartzite (1) also represented. Five of the bifaces were classified as unfinished, and four are nearly finished. Only three of the biface specimens exhibit use wear. The unfinished chert biface fragment exhibits light scraping wear along one edge. The nearly finished fine-grained quartzite specimen shows use wear along the acute left lateral edge. The unfinished hornfels/basalt specimen displays light use wear along the left lateral edge.

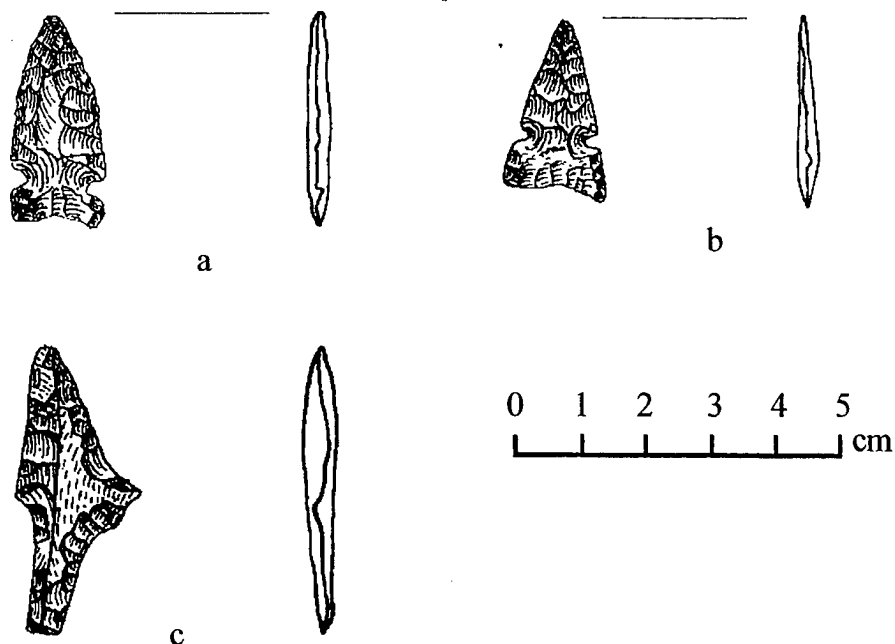


Figure 3.75: Drill and illustrated projectile points from 5LA7400: (a) 5LA7400.0.12; (b) 5LA7400.0.7; (c) 5LA7400.0.15.

Five of the six scrapers are combination end/side scrapers, and the remaining tool is an end scraper. Three of the end/side scrapers and the end scraper are chert. The two remaining end/side scrapers are hornfels/basalt and coarse-grained quartzite. With the exception of the end scraper, all are broken. All are classified as finished tools, with heavy retouch modification used to prepare the scraping edge. Of the end/side scrapers, three exhibit light to heavy use wear on both lateral edges and the distal end. In the remaining two specimens, moderate use wear is seen on the distal end and one lateral edge. The end scraper shows heavy unidirectional use wear on the distal end.

The remaining three artifacts are retouched uniface tools. Two of the specimens are fine-grained quartzite and one is dendritic chert. One of the fine-grained quartzite specimens shows heavy use along the left lateral edge. The other fine-grained quartzite specimen shows moderate use on the distal end and right lateral edge. The dendritic chert specimen displays heavy use wear on the left lateral edge. All display acute utilized edges that are less than 45 degrees.

Six manos were recorded. All are oval shaped with a single, heavily ground surface. The complete mano, which is made of sandstone, measures 10 x 16 cm. Four of the five broken ones are made of sandstone and one of quartzite. The absence of metates is not that unusual because, based on the number of mano caches in the region, it is believed manos were personal tools that were kept and curated. Somewhere in the vicinity there is probably an area of bedrock metates or an area where metates were left near the plants being processed.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7400 is a large lithic scatter measuring nearly 40 acres, and it has a high artifact and ground-stone density. The high density of ground stone suggests intensive plant processing was carried out at the site. Several time-diagnostic artifacts were recovered, as well as the ground-stone tools. Although the deposition is shallow over much of the site, there are some areas that may have substantial deposition. The presence of obsidian and non-local chert suggests the possibility for addressing issues of trade and exchange. We suggest that the site be revisited for more detailed mapping and more thorough surface collection. Areas where there is potential for locating subsurface cultural deposits should be noted and excavated.

5LA7403

This site is located on a ridge/mesa top that extends in a finger-like projection over Sugarloaf Canyon. Sugarloaf Spring is located directly to the south and up a small tributary of the canyon proper. The site is situated on the ridge top and the upper slopes of the canyon rim. A small drainage cuts the northern area of the site. Small drainage depressions dissect the canyon rim in the northern and central parts of the site. Artifact density is variable, with dense clusters somewhat widely spaced. The highest density areas appear to be located near the canyon rim. The prehistoric lithic scatter and historical component of the site cover an area of more than 16 acres (Figures 3.76 and 3.77). The site datum is at an elevation of approximately 1,597 m (5,240 ft) asl. A small knoll in the southern part of the site rises 3-5 m above the datum.

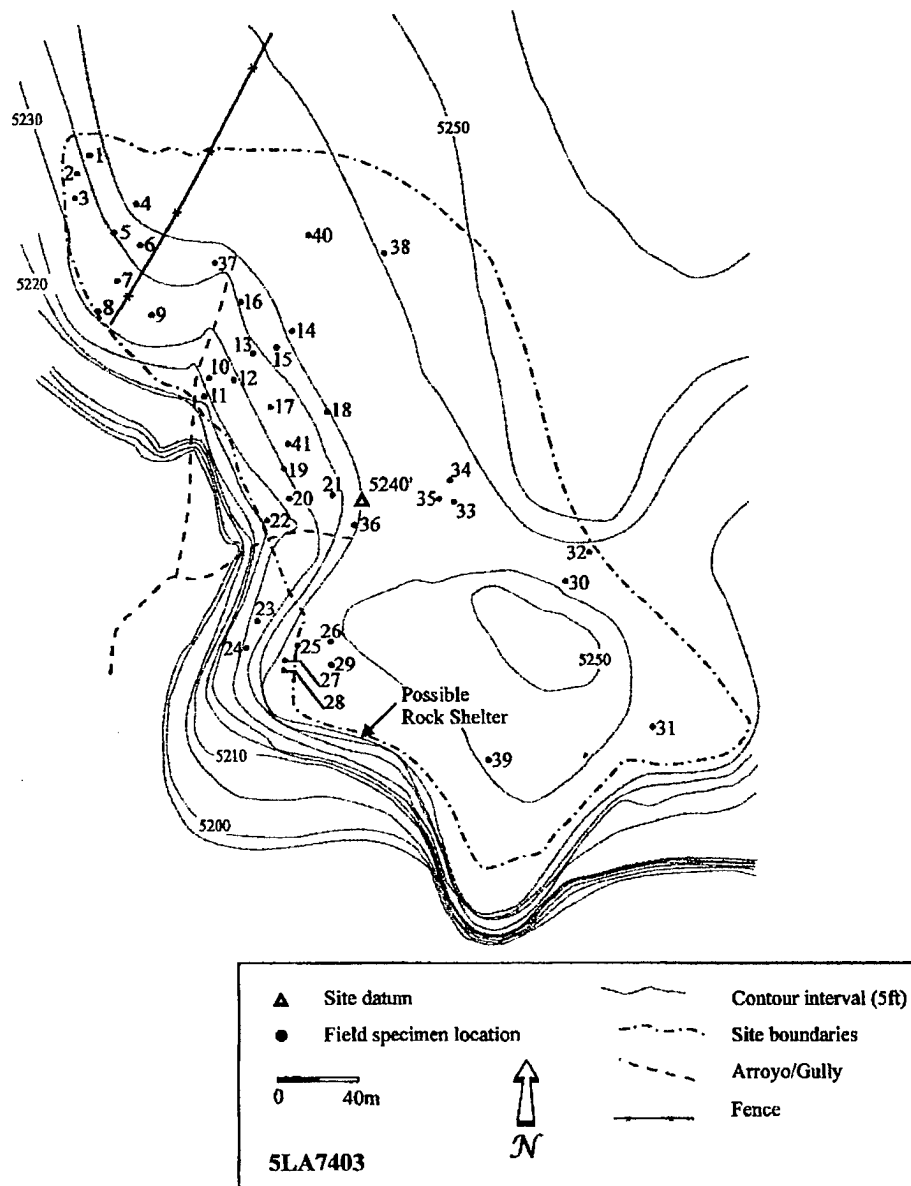


Figure 3.76: Site map, 5LA7403.

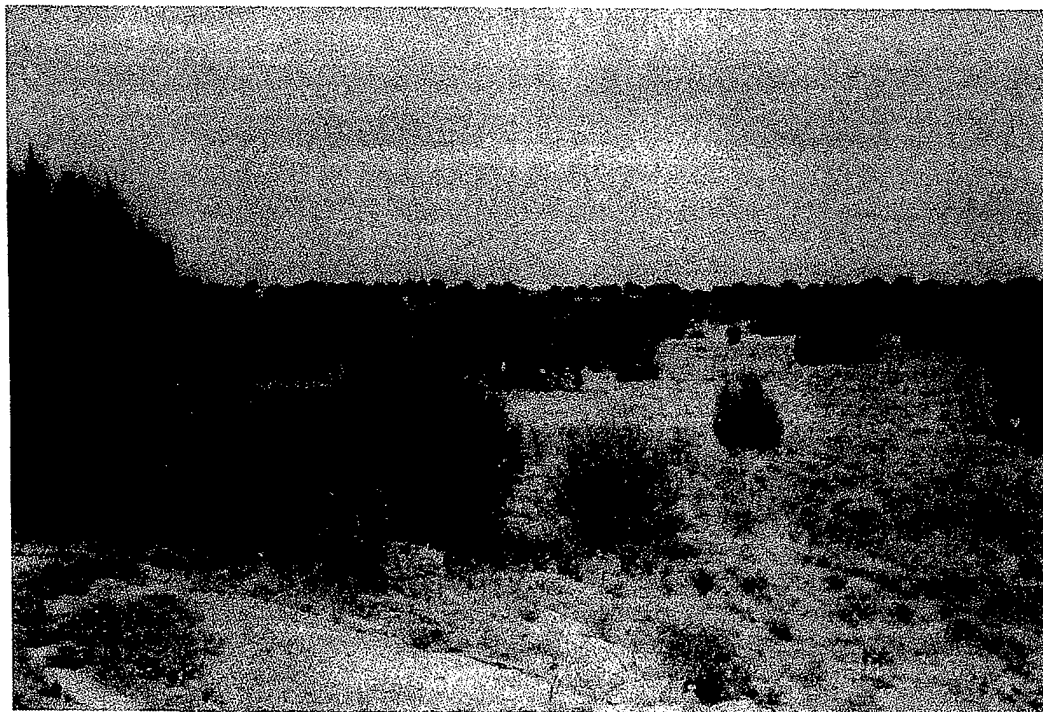


Figure 3.77: Overview of Site 5LA7403 from the southeast hill toward datum.

The site is in a juniper scrub vegetative community. Grama grasses, juniper, yucca, the *Opuntias*, and ricegrass were seen growing on the site at the time it was recorded. Soils are thin near the canyon rim, ranging from exposed bedrock to pockets of between 10 and 20 cm. Areas of deeper deposits (ca. 35 cm) were noted along the site's eastern margin, adjacent to the low bedrock shelf.

The historical component is located along the northern area of the site. It consists of a fence line made of small sandstone piles around the bases of juniper fence posts. Some of the posts are still erect and are about 6 m apart. Barbed wire is still associated with the feature, which almost certainly postdates A.D. 1900.

No fire features were noted, but what may be a small rockshelter is located off the cap rock toward the southern part of the site. While artifacts are found above the cap rock, no surface evidence of human use was seen in or near the rockshelter opening.

A total of 182 pieces of chipped-stone debitage were recorded (Table 3.18). Seven material types were noted, which is a relatively wide range for sites outside the western portion of the Black Hills. Of the total, 75% is quartzite, 21% is chert, 1% is hornfels/basalt, and Alibates chert, argillite, dendritic chert, and silicified wood are less than 1%. Of the quartzite debitage, 82% is the large size grade, while the remaining 18% is small; 35% of the debitage has cortex and 65% is noncortical; and 66% is recorded as simple flakes, 24% as complex flakes, and 9% as shatter, and one flake was classified as a bipolar flake. Of the chert debitage, 64% is large and 36% is small; 38% is cortical and 62% is noncortical; and 39% is classified as simple, 23% as complex, and 39% as shatter.

Table 3.18: Summary Description of Chipped-Stone Debitage for 5LA7403.

	Alibates	Argillite	Chert	Dendritic chert	Hornfels/basalt	Quartzite	Silicified wood
Total flakes	1	1	39	2	2	136	1
Small	1	0	14	1	1	25	1
Large	0	1	25	1	1	111	0
Cortical	0	0	15	2	0	47	0
Noncortical	1	1	24	0	2	89	1
Simple	1	0	15	1	1	90	1
Complex	0	0	9	0	1	33	0
Shatter	0	0	15	1	0	12	0
Bifacial-thinning	0	0	0	0	0	1	0
Bipolar	0	0	0	0	0	1	0

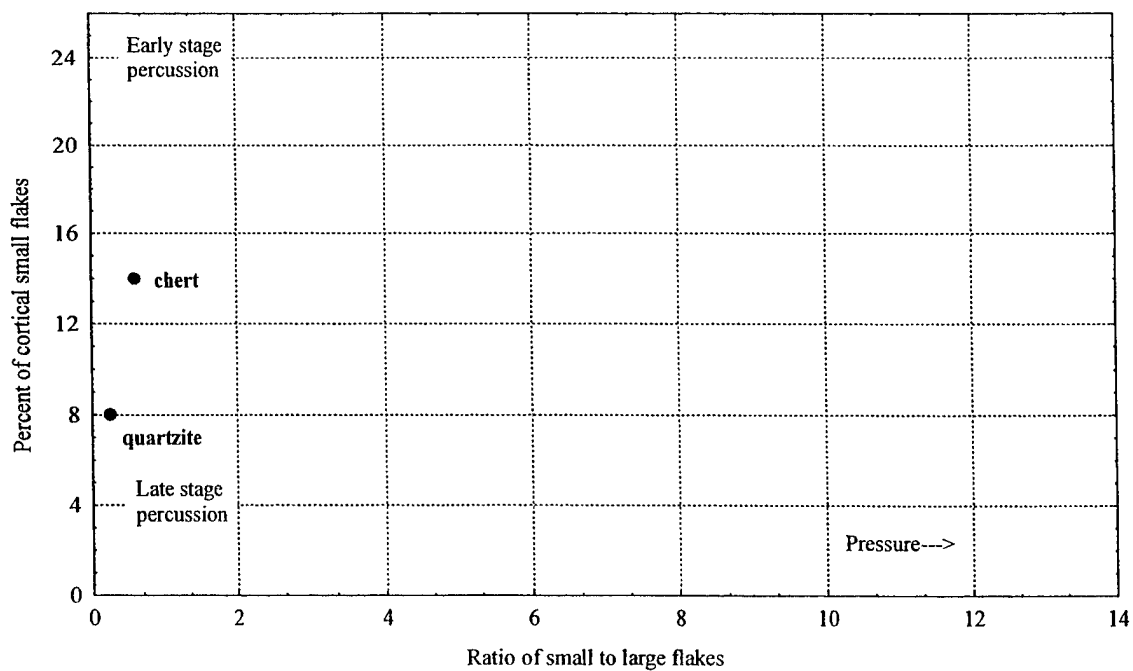


Figure 3.78: Plot of the chert and quartzite debitage from 5LA7403.

It appears that freehand percussion was likely the most important technique in generating both the quartzite and chert debitage (Figure 3.78). Frequencies of small, cortical flakes are low for both chert and quartzite. However, the high percentage of chert shatter and the low small to large flake ratio suggests that the chert debitage was produced in early-stage lithic reduction activities, such as core reduction or testing. In contrast to the majority of the other sites analyzed, the quartzite debitage appears to have been generated by later-stage, freehand percussion.

Two diagnostic projectile points were recovered from the site. One specimen (5LA7403.0.2) resembles Anderson's (1989) P58 type and has associated dates that range from A.D. 600 to A.D. 1200. The other specimen (5LA7403.0.5) is similar to Anderson's P42 type, which has associated dates that range from between A.D. 600 and A.D. 1600. Both projectile points suggest a primary occupation of the site that extends from the Early Ceramic stage (A.D. 200 to A.D. 800/1000) to the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

Ten non-bipolar cores, five bifaces, four bifacial core-tools, two end/side scrapers, two retouched uniface tools, and one drill were recovered from the site surface. Five of the cores and three of the bifacial core-tool specimens are made of coarse-grained quartzite. Of the remaining core specimens, four are chert, and one is hornfels/basalt. The material type for the last core-tool is identified as quartz.

Of the bifaces, three are complete and two are fragments. Chert (3) is the primary material type, with fine-grained quartzite (1), and siltstone (1) also represented. Four are nearly finished specimens and one an unfinished biface. The presence of use wear was not detected in any of the bifaces.

Both end/side scraper specimens are complete. The chert specimen is classified as nearly finished and exhibits heavy usage along the left lateral edge and distal end. Based on patterned retouch modification, the quartzite end/side scraper is classified as finished. Identifiable light to moderate use wear is seen along the left lateral edge and the distal end.

The remaining three artifacts are two retouched uniface tools and one drill bit fragment. Both uniface tool specimens are quartzite and classified as finished. The complete uniface shows light use wear along both lateral edges. The broken tool exhibits light usage on the left lateral edge. The drill fragment is made of chert and classified as finished. Heavy usage and retouch modification is apparent on both lateral bit edges.

Ten pieces of ground stone were recorded at the site. Three of these are manos and the remaining seven are metates. Interestingly, one of the manos and five of the metates have evidence of battering on the grinding surfaces or edges. The high frequency of ground stone indicates that plant processing was an important activity carried out at the site.

We recommend that the prehistoric component of the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The fence line is not significant. Site 5LA7403 is a large lithic scatter with a high artifact and ground-stone density. Several time-diagnostic

artifacts were recovered and indicate the likelihood that the site is multicomponent. It may contain information for addressing chronological and processual issues. The presence of Alibates chert (a non-local material) also suggests the possibility of trade and exchange. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating subsurface cultural deposits should be test excavated.

This site is located in a flat grassy plain about 30-40 m southeast of the upper reaches of Sugarloaf Canyon. A ridge/mesa top extends in a finger-like projection out into Sugarloaf Canyon. The site is a lithic scatter and appears to be a pot drop. The pottery sherds (Feature 1) are located approximately 2.5 m west southwest of the site datum. The lithic scatter is sparse, consisting of only 7 flakes and one core in the 0.253-acre area (Figures 3.79 and 3.80). The site datum is at an elevation of approximately 1,590 m (5,215 ft) asl. Topographic relief is slight, with about a 2-m increase in elevation from the datum to the southeast edge of the site.

Figure 3.79: Site map, 5LA7410.

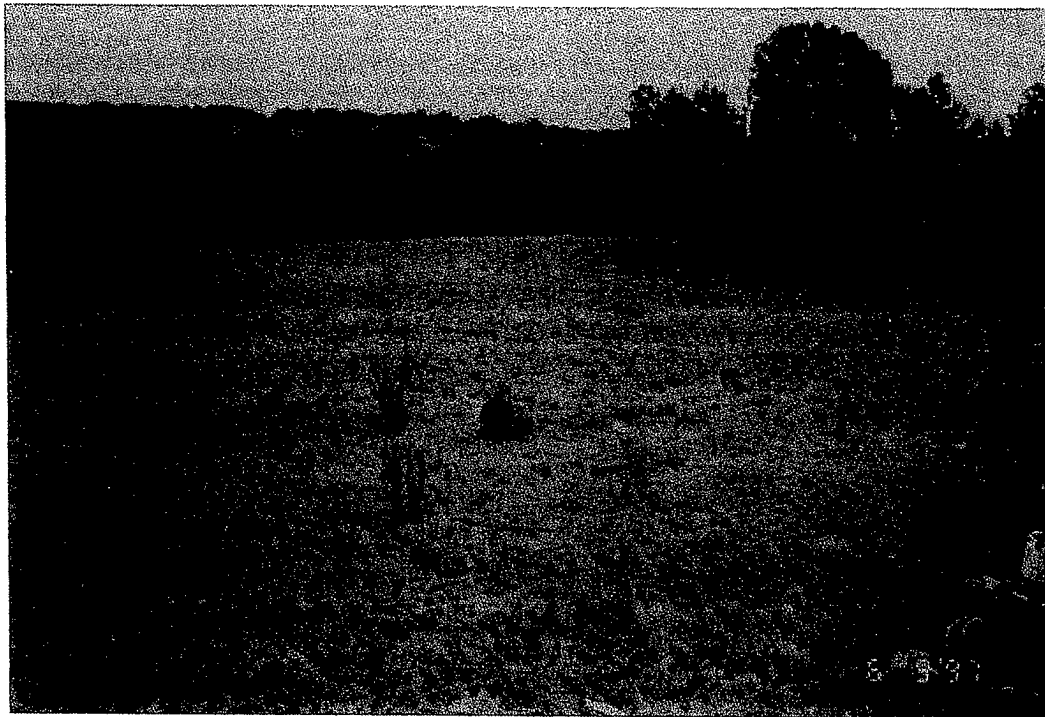


Figure 3.80: Overview of Site 5LA7410 facing north toward the canyon. Potsherds are foreground center frame, double flagged. Datum at far right side of frame.

The site is situated within a juniper scrub vegetative community. The *Opuntias*, grama grasses, *Rhus trilobata*, and yucca were the predominate species growing when the site was recorded. The soils are variable across the site. There are some areas of exposed bedrock, while other places have approximately 30 cm of deposits.

The site was revisited for testing after its initial discovery. It was thought that more of the vessel would be recovered if some minor subsurface testing were carried out. A 1-x-1 m test unit, with its side walls aligned to the cardinal directions, was placed over Feature 1. A single 10-cm level was excavated across the unit. Two sherds were recorded from the surface prior to excavation. The remaining sherds were recovered from the top 2 to 3 cm. We noted that sherds continued into the eastern wall of the test unit, suggesting that if another unit was placed there, more of the vessel could be recovered. The fill that was excavated from the unit is a highly consolidated silty loam, with calcium carbonate inclusions intermixed throughout. Surface collection and excavation of the feature yielded a total of 208 plain body sherds and one rim sherd from a single concoidal jar with a tapered rim. Surface erosion has made the finishing characteristics for many sherds impossible to determine. Temporal placement for this vessel is unknown (Appendix II).

The chipped-stone debitage includes four quartzite flakes, two chert flakes, and one argillite flake. Counts of chipped-stone debitage are too low for meaningful analysis. No chipped-stone tools were recorded from the site.

We recommend that the site be considered as eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The site is most significant for a ceramic vessel, a class of artifact hard to find in the region. As noted above, there is a high probability of recovering more sherds from the vessel if additional test units are excavated. We suggest that the site be revisited in order to excavate at least one additional test unit to the east of the one already dug.

5LA7416

This lithic scatter and possible structure site is located on a ridge between two small drainages on the western edge of the project area (Figures 3.81 and 3.82). The site is confined mostly to the ridge/mesa top, but does extend down into the flanking drainages. The datum is at an elevation of approximately 1,562 m (5,125 ft) asl. The top of the ridge on which the site is located is approximately 5 m above the bottom of the drainages to either side.

The site is situated within a juniper scrub vegetative community. *Opuntias*, grama grasses, and yucca were the predominate plants growing when the site was recorded. The soils are generally thin, with less than 5 cm of deposition on the ridge top, but some pockets of approximately 17 cm were noted.

A concentration of lithics was found at the southern end of the site, but it was not assigned a feature number. Eight chipped-stone tools, one of which is an obsidian projectile point (FS 2), were associated with this cluster. Two possible structures (Features 1 and 2) are located just to the north of the lithic concentration. The structures are made by stacking large blocks of sandstone into rectangular shaped walls. One measures 3 by 3.25 m (Feature 1, Figure 3.83) and the other measures 2.7 by 1.4 m (Feature 2). These structures are fragmentary and they may be historic. Because of their fragmentary nature and possible affiliation with the historic period, the structures are not amenable to Kalasz's (1989) classification.

A total of 169 pieces of chipped-stone debitage were recorded from the site (Table 3.19). Of the total, 67% is quartzite, 21% is chert, 6% is hornfels/basalt, 5% is argillite, and one flake is made of obsidian. Of the quartzite debitage, 82% falls into the large size grade while the remaining 18% is recorded as small; 40% of the debitage has cortex and 60% is noncortical; and 62% is recorded as simple flakes, 37% as complex flakes, and 1% as shatter. Of the chert debitage, 33% is large and 67% is small; 19% is cortical and 81% is noncortical; and 47% is classified as simple, 36% as complex, and 17% as shatter.

It appears that freehand percussion was likely the most important technique in generating both the quartzite and chert debitage (Figure 3.84). There is a relatively low percentage of quartzite cortical small flakes, suggesting that some quartzite tool manufacture/maintenance occurred at the site. A relatively high percentage of chert flakes is cortical, this pattern, coupled with the number of small flakes, indicates both early- and late-stage lithic reduction strategies. Counts for the remaining material types are too low for meaningful analysis.

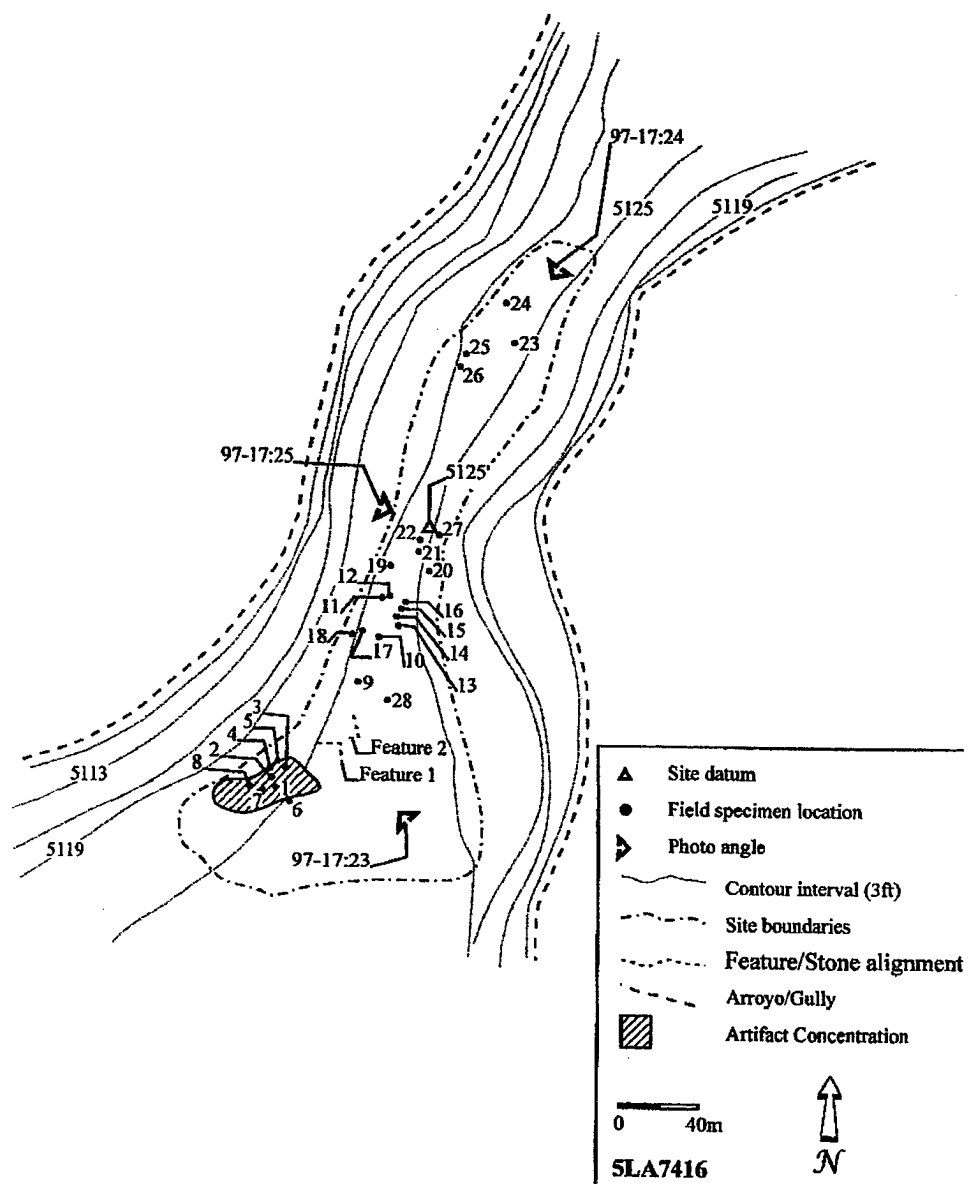


Figure 3.81: Site map, 5LA7416.

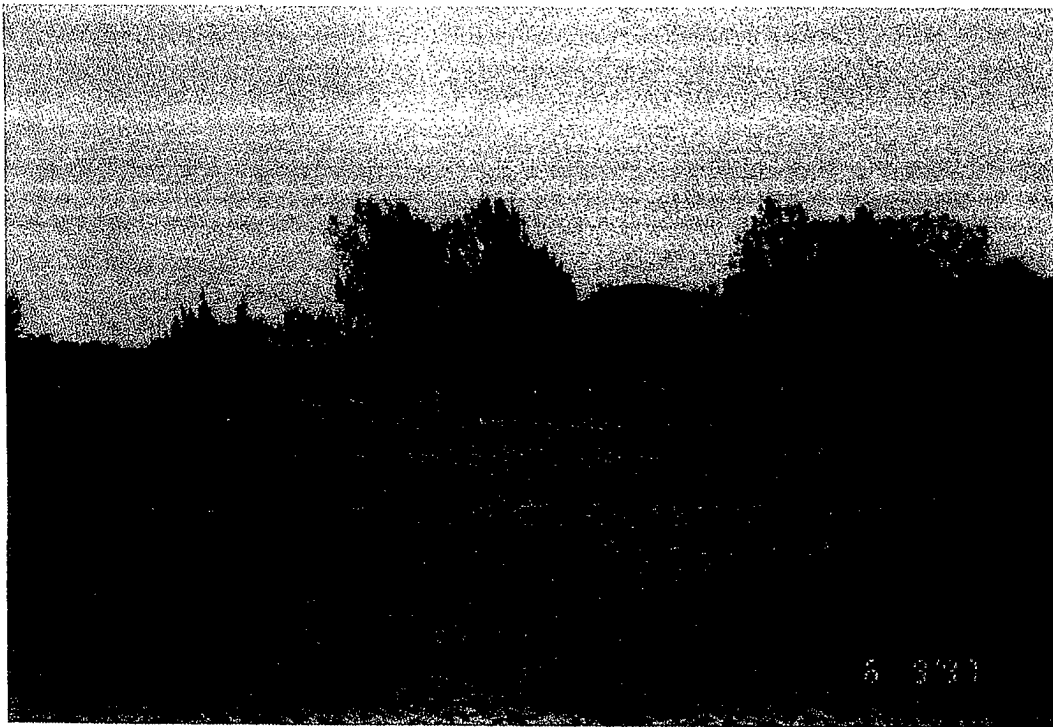


Figure 3.82: View of Site 5LA7416, looking northeast at lithic concentration at the bottom of slope.

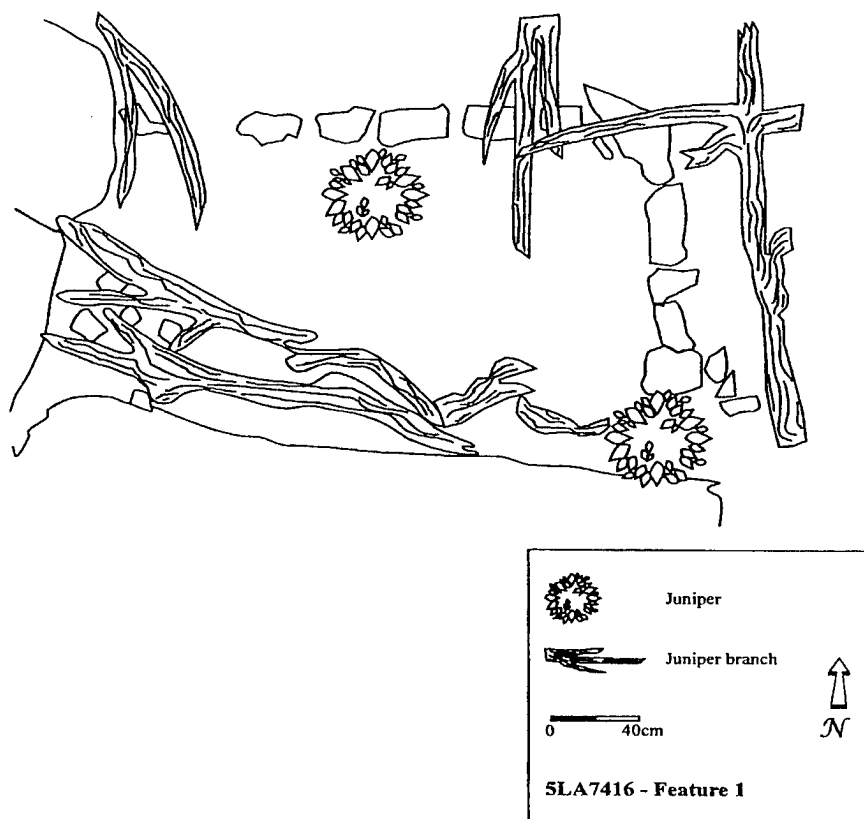


Figure 3.83: Planview of Feature 1, 5LA7416.

Table 3.19: Summary Description of Chipped-Stone Debitage for 5LA7416.

	Argillite	Chert	Hornfels/Basalt	Obsidian	Quartzite
Total flakes	8	36	10	1	114
Large	7	12	6	1	93
Small	1	24	4	0	21
Cortical	5	7	7	0	46
Noncortical	3	29	3	1	68
Complex	4	13	2	1	42
Shatter	0	6	1	0	1
Simple	4	17	7	0	71
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0

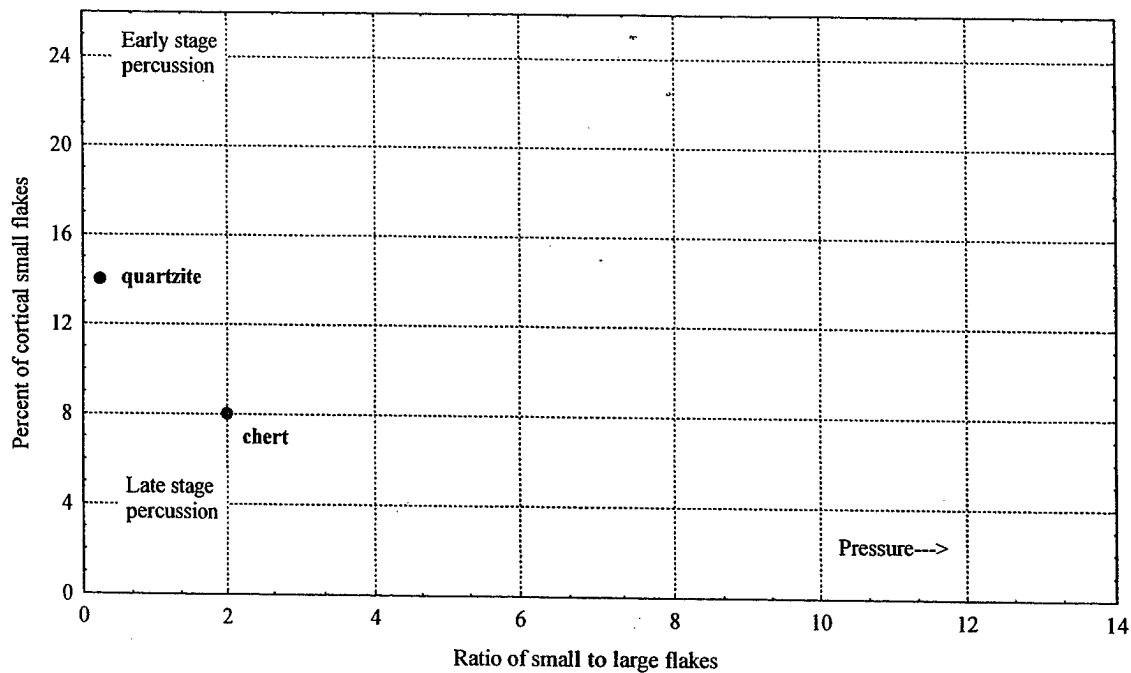


Figure 3.84: Plot of the chert and quartzite debitage from 5LA7416.

Two pieces of obsidian (5LA7416.0.1 and 5LA7416.0.7) were recovered from the surface approximately 20 m south of the site datum. The two pieces were submitted for sourcing (Appendix III) and found to come from the Cerro del Medio source area of the Jemez Mountains, New Mexico. The obsidian projectile point was not submitted for sourcing.

One diagnostic projectile point was recovered from the site (Figure 3.85). This specimen (5LA7416.0.3) is similar to Anderson's (1989) P59 type, which is associated with dates that range between A.D. 500 to A.D. 1200. Based on this artifact, the site may have had an occupation during either the Early Ceramic stage (A.D. 200 to A.D. 800/1000) or the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

The tool assemblage consists of three non-bipolar cores, three bifacial core-tools, two bifaces, one end/side scraper, one uniface flake tool, and one utilized flake. Two of the three bifacial core-tools are chert. The remaining specimen is coarse-grained quartzite. The material types for the cores are chert, fine-grained quartzite, and hornfels/basalt. The biface specimens are broken. The reduction stage for the fine-grained quartzite biface is nearly finished and the chert specimen is unfinished. Both exhibit retouch modification with no visible use wear. The end/side scraper is made of chert and is complete. This specimen is classified as finished, with distinct retouch modification and moderate to heavy use wear on the distal end and both lateral edges. The hornfels/basalt uniface specimen is classified as unfinished, and it is complete. Because no use wear was noted, this specimen was likely resharpened, then discarded. The utilized flake is broken and made of dendritic chert. Light use wear is seen along the remaining portion of the acute right lateral edge.

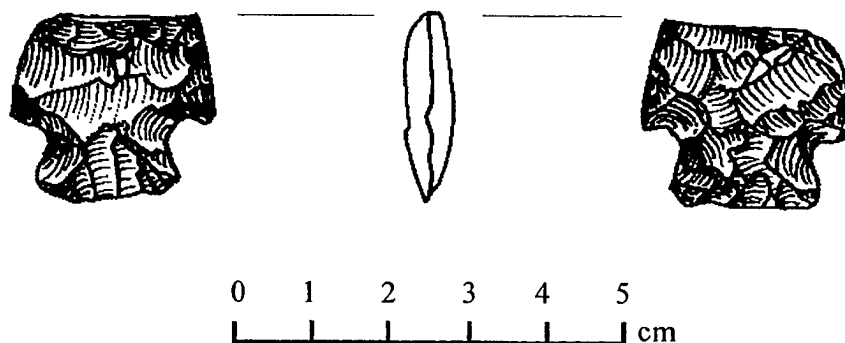


Figure 3.85: Projectile point (5LA7416.0.3) from the surface of 5LA7416.

Eleven pieces of ground stone were recorded at the site. Three of these are manos and the remaining eight are metates. None of the manos, and only one of the metates, have evidence of pecking. One metate (FS 15 a and b) is broken and recorded as two separate pieces. FS 11 and 12 are two grinding surfaces of a bedrock metate that is located approximately 40 m south southwest of the site datum. The high frequency of ground stone indicates that plant processing occurred in or around the site.

Site 5LA7416 is a large lithic scatter that has a high artifact and ground-stone density. The density of ground stone suggests that plant processing was carried out in or around the site. One diagnostic artifact was recovered, as well as the ground-stone tools. The presence of two possible structures might allow research to address issues regarding the settlement system at the PCMS. Although the deposition is shallow over much of the site, there are some areas that may have deposition that covers intact deposits. The presence of obsidian suggests the possibility for addressing issues of trade and exchange. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Areas where there is a good potential for locating buried intact deposits, as well as the areas around the possible structures, should be test excavated. We recommend that the prehistoric component of this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D).

5LA7418

The site is a lithic scatter in a small erosional basin on the slopes south of the Black Hills and above the headwaters of the drainage into Welsh Canyon. This small site is contained in an area of less than one-half acre (Figure 3.86). The site datum is at the bottom of the basin at an elevation of approximately 1,555 m (5,100 ft) asl. The upper portions of the site, to the northeast and southwest, rise approximately 10-15 m above the basin.

The site is situated within a juniper scrub vegetative community. Juniper is the dominant vegetation, although the immediate area is eroded and not densely covered with vegetation. *Yucca*, cholla, juniper, *Opuntias*, and various grasses also grow on the site. The soils are generally thin, with less than 5 cm of deposition and areas of exposed bedrock.

A total of 57 pieces of chipped-stone debitage were recorded (Table 3.20). Of the total, 75% is quartzite, 19% is chert, 2% is hornfels/basalt, 2% is quartz, and 2% is silicified wood. Of the quartzite debitage, 72% is large, while the remaining 28% is small; 49% of the debitage has cortex and 51% is noncortical; and 60% is recorded as simple flakes, 33% as complex flakes, and 7% as shatter. Of the chert debitage, 55% is large and 45% is small; 27% is cortical and 73% is noncortical; and 55% is classified as simple, 36% as complex, and 9% as shatter.

Freehand percussion generated the quartzite and chert debitage. Given the relatively low percentage of cortical, small flakes, it appears that some quartzite tool manufacture/maintenance and early-stage core reduction also occurred at the site. A high percentage of chert flakes is cortical. This pattern, along with the number of small flakes, perhaps indicates both early- and late-stage lithic reduction strategies.

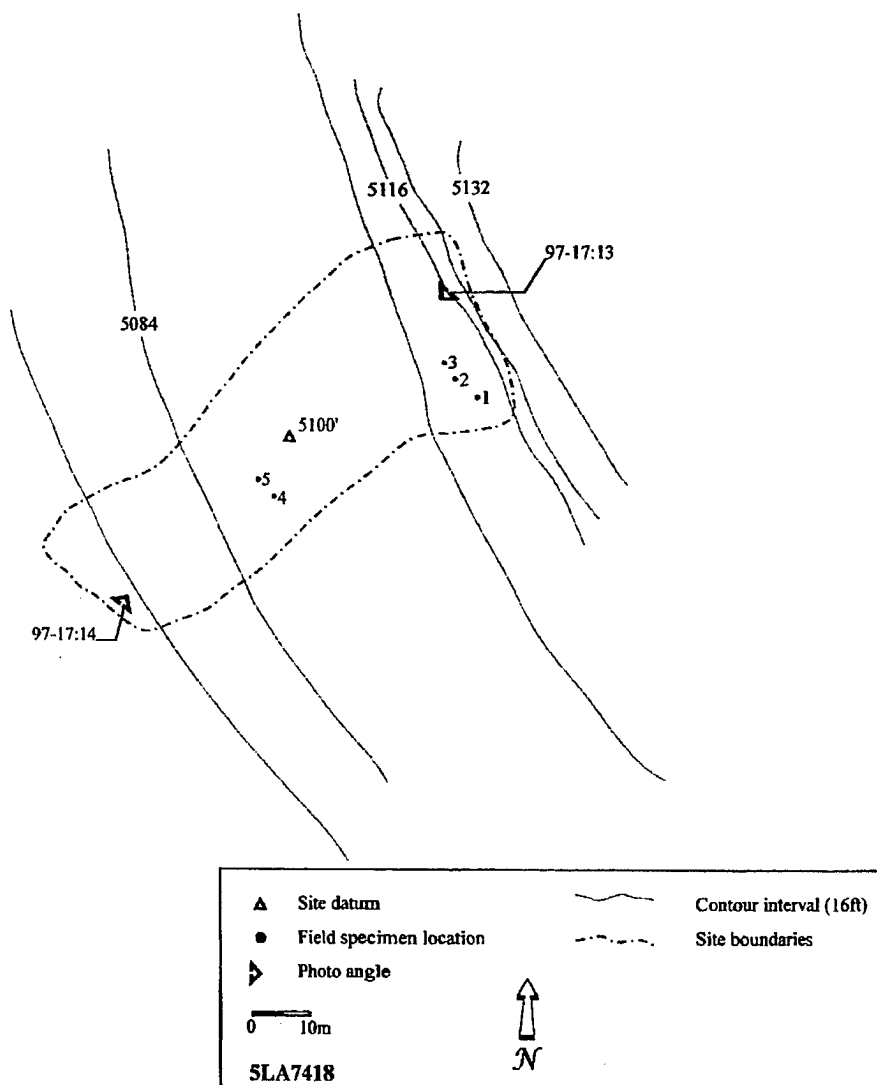


Figure 3.86: Site map, 5LA7418.

Table 3.20: Summary Description of Chipped-Stone Debitage for 5LA7418.

	Chert	Hornfels/Basalt	Quartz	Quartzite	Silicified wood
Total flakes	11	1	1	43	1
Small	5	1	0	12	1
Large	6	0	1	31	0
Cortical	3	0	1	21	0
Noncortical	8	1	0	22	1
Simple	6	0	1	26	0
Complex	4	1	0	14	1
Shatter	1	0	0	3	0
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0

One diagnostic projectile point is recorded from the site (Figure 3.87). This specimen (5LA7418.0.1) has characteristics (such as a collateral flaking, basal grinding, and contracting stems) that are similar to Hell Gap points known from other areas in the Great Plains (Frison 1974). This artifact is most similar to Anderson's (1989) P3 type and has an early temporal range of between 7200 B.C. and 6500 B.C. Based on this artifact, the site likely has an occupation that can be placed in the Late Paleo-Indian period (8200 B.C. to 5500 B.C.).

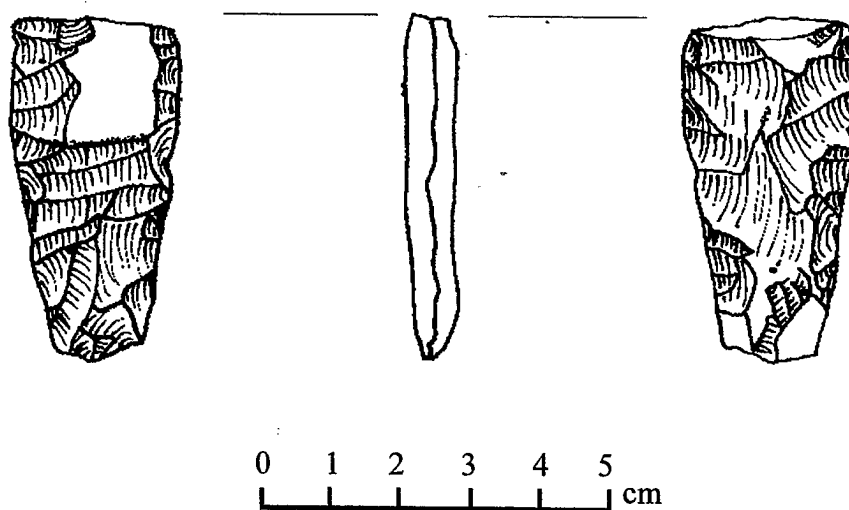


Figure 3.87: Projectile point from the surface of 5LA7418.

One finished biface represents the flaked tool assemblage. This specimen is the medial portion of a biface knife (edge angle < 45 degrees), which is made from fine-grained quartzite. Retouch modification and moderate use wear is seen on both lateral edges.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7418 is a lithic scatter with thin soils. Good areas for test excavation to search for intact cultural deposits are not immediately evident from a surface examination. This is unfortunate because Paleo-Indian artifacts are not common in the region, and an intact site would be an important discovery. This site is considered worthy for the National Register, simply on the strength of the surface discovery of the old artifact. We suggest that the site be revisited periodically to determine if erosional processes uncover additional artifacts from the remaining soils at the site. If thermal features become apparent, they should be tested to determine the presence or absence of intact cultural deposits.

5LA7419

The site is a large lithic scatter located along the southern boundary of the Black Hills. It is situated in a sloping drainage near the ridge top. The approximately 3-acre site extends across a north-to-south trending slope and is bisected by a small arroyo (Figure 3.88). Small arroyos can also be found along both the east and west boundaries of the site. The site elevation ranges between approximately 1,561 m and 1,573 m (5,120 and 5,160 ft).

The site is located in the juniper scrub vegetative community typical of the Black Hills. Along with juniper, grama grasses and yucca were noted on the site. Soils are relatively thin, with soil depths of between approximately 10 and 15 cm.

Many large sandstone boulders are scattered throughout the site, and the cap rock near the mesa top includes small rockshelters. One possible Paleo-Indian point was recovered. Unfortunately, less than 10 cm of deposition is found in the area where the Paleo-Indian artifact was recovered, and none of the rock overhangs has much depth. As these locations were devoid of cultural material, they were not assigned feature numbers.

A total of 160 pieces of chipped-stone debitage were recorded from the site (Table 3.21). Of the total debitage, 74% is quartzite, 23% is chert, 2% is hornfels/basalt, 2% is chalcedony, and 2% is argillite. Of the quartzite debitage, 81% is the large size grade, while 19% is small; 32% of the debitage is noncortical and 68% has cortex; and 22% is recorded as complex flakes, 6% as shatter, and 72% as simple flakes.

It appears that freehand percussion was likely the most important technique used to generate the quartzite debitage (Figure 3.89). Earlier stages of quartzite lithic reduction were also carried out at the site. Because the count of small quartzite flakes is low (23), the results may be somewhat skewed.

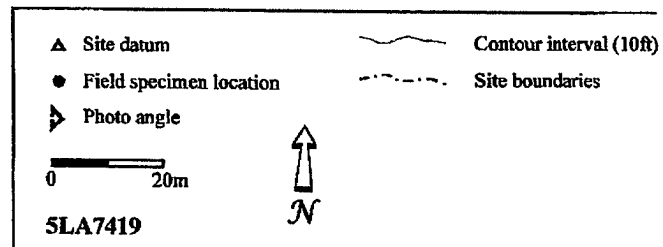
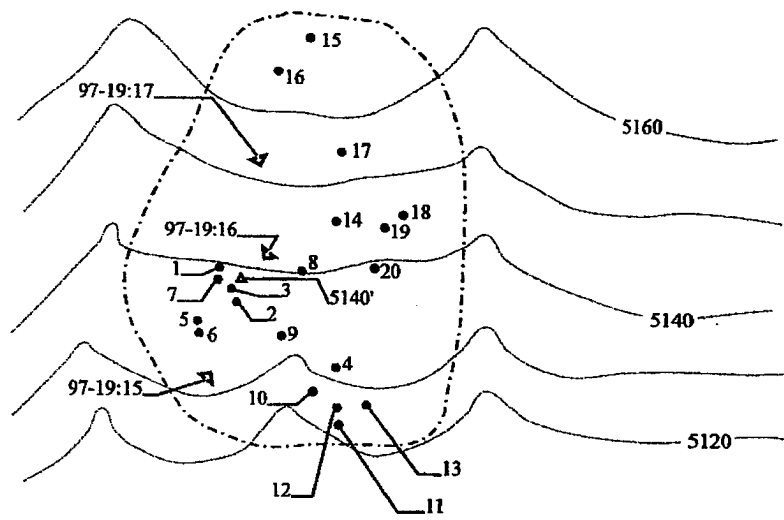


Figure 3.88: Site map, 5LA7419.

Table 3.21: Summary Description of Chipped-Stone Debitage for 5LA7419.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Quartzite
Total flakes	2	2	36	2	118
Small	1	2	20	1	23
Large	1	0	16	1	95
Noncortical	0	0	11	1	38
Cortical	2	2	25	1	80
Simple	2	1	16	2	85
Complex	0	1	7	0	26
Shatter	0	0	13	0	7
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0

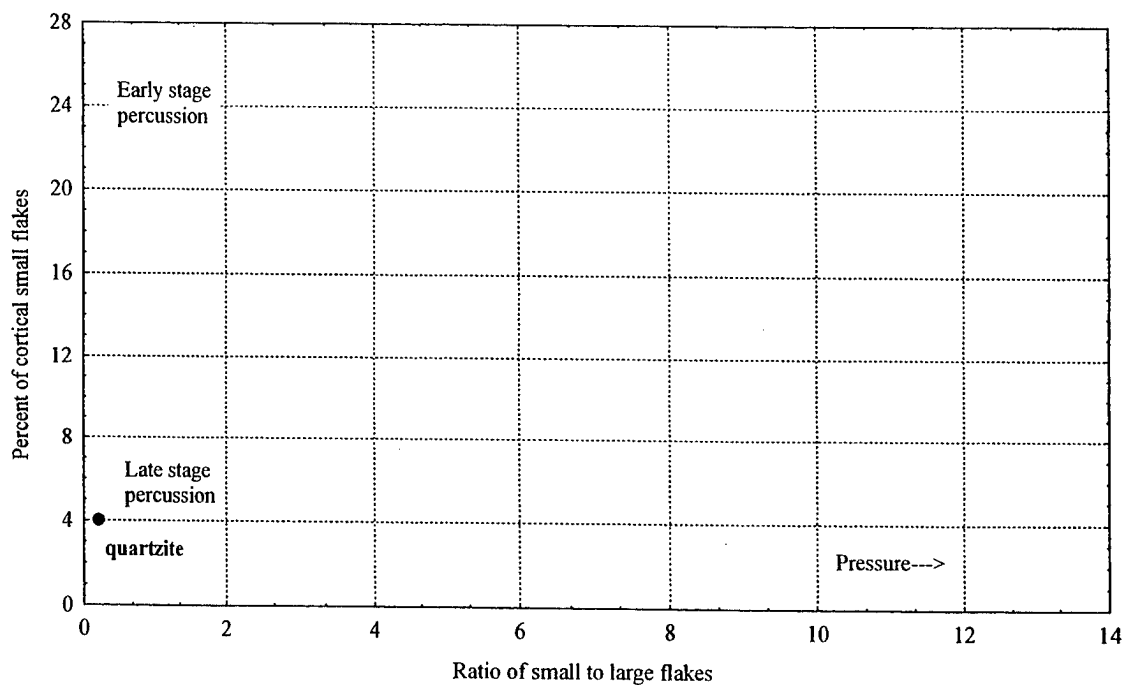


Figure 3.89: Plot of the quartzite debitage from 5LA7419.

Two diagnostic projectile points were found at the site. One of these specimens (5LA7419.0.1) has characteristics (such as a collateral flaking, basal grinding, and a contracting stem) that is similar to Hell Gap points known from other areas in the Great Plains (Frison 1974). The artifact is most similar to Anderson's (1989) P3 type and has an early temporal range of between 7200 B.C. and 6500 B.C. Based on this artifact, the site likely has an occupation that can be placed in the Late Paleo-Indian period (8200 B.C. to 5500 B.C.). The second specimen (5LA7419.0.7) resembles Anderson's P54 and has associated dates from A.D. 750 to A.D. 1400. This artifact suggests a second, more recent, occupation of the site that falls within the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

The stone-tool assemblage consists of eleven artifacts, of which four are bifacial core-tools, three are utilized flakes, two are bifaces, one is a non-bipolar core, and one is a retouched uniface tool. Three of the four bifacial core-tool specimens are quartzite, and one is hornfels/basalt. The core specimen is coarse-grained quartzite. Of the utilized flakes, all are complete. The chert and quartzite specimens show light cutting (< 45-degree) use wear on the lateral edge. The siltstone specimen exhibits scraping use on both lateral edges. The bifaces are complete and made of quartzite. The finished specimen was likely used as a knife and exhibits light use wear on the lateral edges. The unfinished specimen was not utilized. The uniface tool was visually identified as Alibates chert and is broken. Light use wear from scraper usage and retouch modification is seen along one irregular edge.

Three metates and two manos were also recorded at the site. Two of the metates have shallow basins, and one is flat; in all, the striation orientation could not be determined. One of the manos (FS 16) had two ground surfaces. The other mano (FS 11) is whole and measures 13 x 9 cm.

We recommend that this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7419 is a large lithic scatter from which a possible Paleo-Indian point was recovered. Since Paleo-Indian sites are relatively rare on the PCMS, this site represents a rather unique and important cultural resource. The site is also undergoing considerable erosion. Areas that still retain some deposition should be examined or perhaps tested to salvage any remaining Paleo-Indian data that may still be intact. We suggest that the site be revisited periodically to determine if erosional processes or military activities uncover additional artifacts from the remaining soils at the site. If thermal features become apparent, they should be tested to determine the presence or absence of intact cultural deposits.

5LA7420

The site is a large lithic scatter located along the southern boundary of the Black Hills. It is situated south of a small arroyo on the slopes leading down from the top of the ridge that defines the Black Hills. The 11.3-acre site extends across an east-to-west trending slope (Figures 3.90 and 3.91). The site datum is at approximately 1561 m (5120 ft) asl. The site rises an additional 3-4 m along the eastern edge.

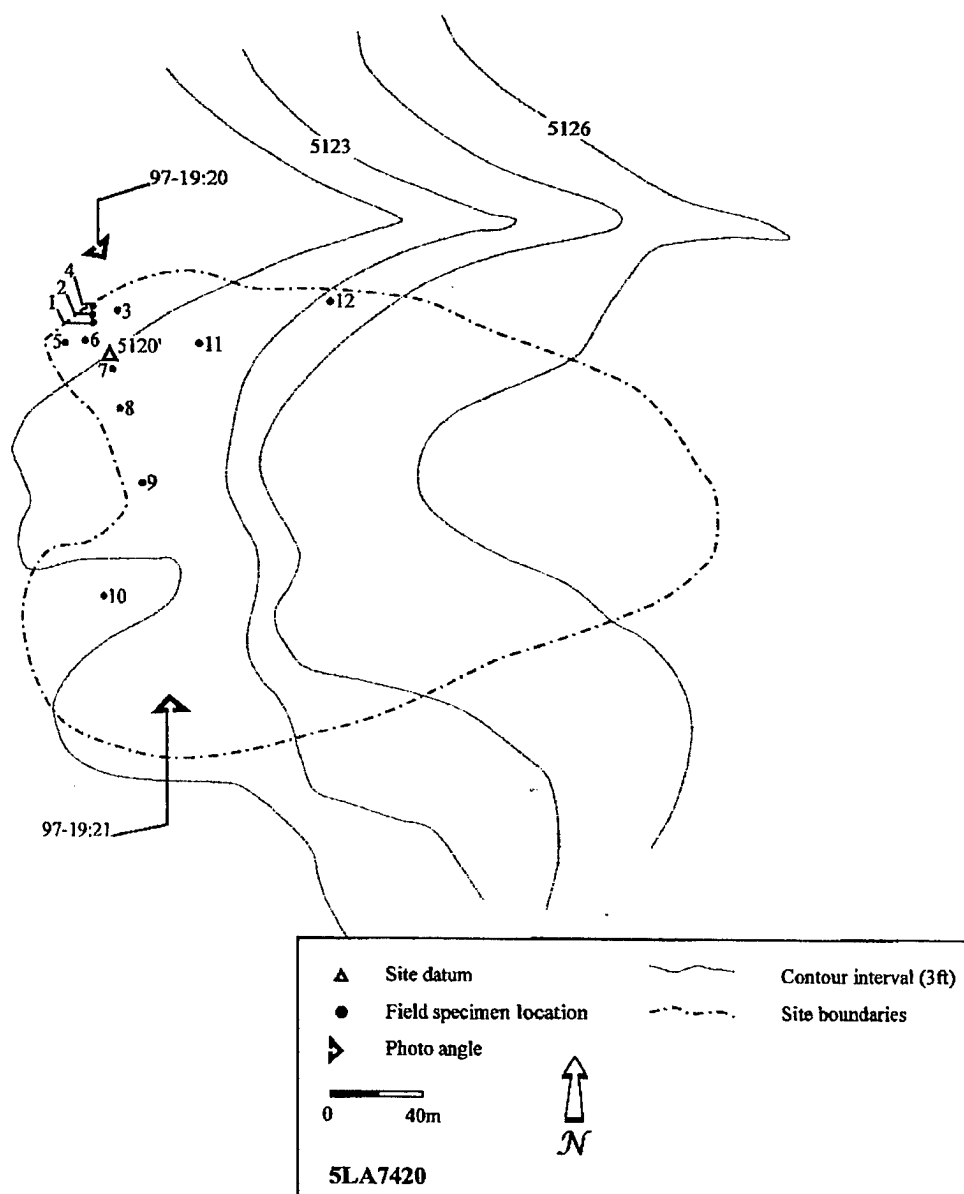


Figure 3.90: Site map, 5LA7420.

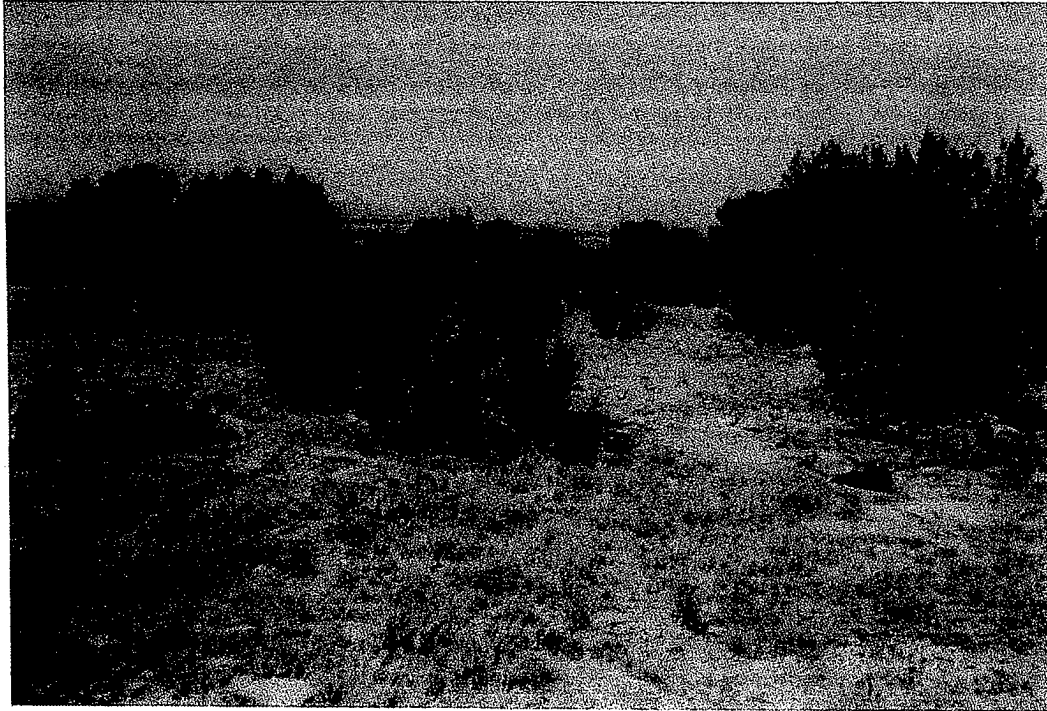


Figure 3.91: Site overview of 5LA7420, facing south-southwest toward datum.

The site is located in the juniper scrub vegetative community typical of the Black Hills. Along with juniper, prickly pear, cholla, and yucca were growing on the site when it was recorded. Soils are relatively thin, with a maximum soil depth of approximately 10 cm.

A total of 145 pieces of chipped stone were recorded at the site (Table 3.22). Of the total debitage, 88% is quartzite, 6% is argillite, 3% is chert, 1% is hornfels/basalt, and there is one flake each of chalcedony and obsidian. Of the quartzite debitage, 65% falls into the large size grade, while 35% is small; 59% of the debitage is noncortical and 41% has cortex; and 28% is recorded as complex flakes, 2% as shatter, and 70% as simple flakes.

Figure 3.92 shows a scatter plot of the quartzite debitage. Based on the plot, it appears that freehand percussion likely generated the quartzite debitage. The plot also suggests that the earlier stages of quartzite lithic reduction were carried out at the site. The counts of the remaining material types are too low for meaningful analysis.

Two temporally diagnostic projectile points were recovered from the site (Figure 3.93). One specimen (5LA7420.0.8) resembles Anderson's (1989) P26 type and has associated dates that range from 1000 B.C. to A.D. 500. The second specimen (5LA7420.0.5) is similar to a P59 type and is associated with dates from between 500 A.D. and 1200 A.D. The two artifacts indicate two occupations: one in the Late Archaic Stage (A.D. 1000 to A.D. 200) and one in the Early Ceramic stage (A.D. 200 to A.D. 800/1000). Another possibility is that the two specimens date circa A.D. 500 and the occupation falls solely within the Early Ceramic stage (A.D. 200 to A.D. 800/1000).

Table 3.22: Summary Description of Chipped-Stone Debitage for 5LA7420.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Obsidian	Quartzite
Total flakes	8	1	5	2	1	128
Large	6	0	2	1	0	83
Small	2	1	3	0	1	45
Noncortical	6	1	4	2	1	75
Cortical	2	0	1	0	0	53
Bifacial-thinning	0	0	0	0	0	0
Bipolar	0	0	0	0	0	0
Complex	4	0	1	2	0	36
Shatter	0	0	0	0	0	2
Simple	4	1	4	0	1	90

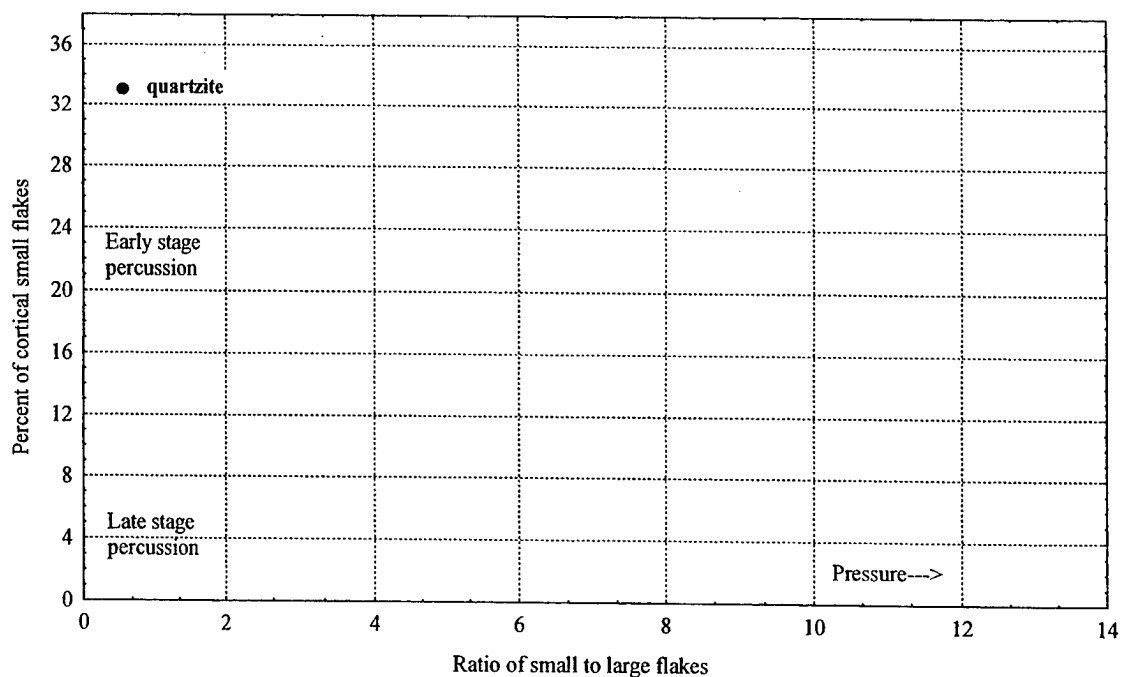


Figure 3.92: Plot of the quartzite debris from 5LA7420.

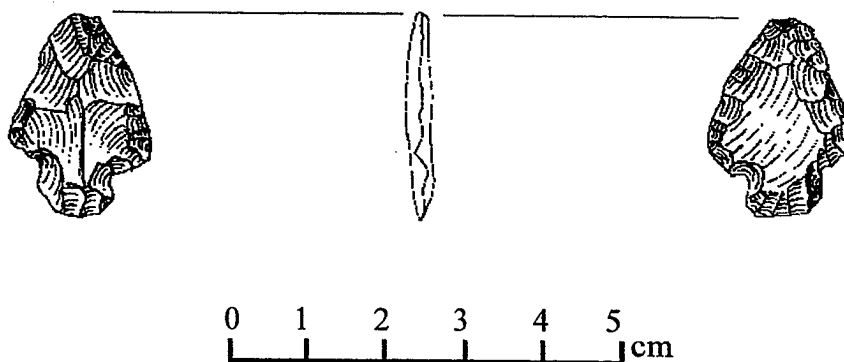


Figure 3.93: Projectile point (5LA7420.0.5) from the surface of 5LA7420.

Six specimens comprise the tool assemblage. Of these, three are non-bipolar cores, and three are bifaces. The cores are two chert specimens and one hornfels/basalt specimen. Of the bifaces, two are broken and one is complete. Both the chert and quartzite specimens are classified as unfinished and display no visible use wear. The hornfels/basalt specimen was utilized as a cutting tool, with moderate use wear on both lateral edges. This specimen is classified as nearly finished.

Two manos (FS 4 and 5) were found near the datum in the northwestern portion of the site. One (FS 4) measures 9 x 8 x 4 cm, and the other (FS 5) is 5 x 4 x 1.5 cm. Both are broken and represented less than 50% of the original piece.

One piece of obsidian was recovered from the site (FS 2). This specimen (5LA7420.0.2) was submitted for x-ray fluorescence (Appendix III) and sourced to the Polvadera Peak locale of the northern portion of the Jemez Mountains in New Mexico.

We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7420 is a large lithic scatter with some potential areas of intact, buried cultural deposits. Two temporally diagnostic projectile points were recovered, indicating the potential for locating more tools through test excavations. Artifact counts and density were high, especially near the site datum. More obsidian, useful for reconstructing trade networks, may be recovered through additional fieldwork at the site. We suggest that the site be revisited for more detailed mapping and thorough surface collection. Areas where there is good potential for locating buried, intact deposits should be noted and tested to determine whether such deposits are present.

5LA7421

This lithic scatter and structure site is located on a gently sloping erosional terrace that is at the head of a tributary drainage feeding Sugarloaf Canyon (Figures 3.94 and 3.95). It is located in a small erosional gully bounded on the north and west by a low bedrock ledge. The canyon edge is to the northeast of the site, and Sugarloaf Spring is located approximately 400 m to the west-northwest. The site is just to the east-southeast of 5LA6107, a large lithic scatter with at least one structure and a historical component. The site datum is at an elevation of approximately 1,591 m (5,220 ft) asl. The exposed bedrock ridge rises approximately 8 m above the site datum.

The site is in the juniper scrub vegetative community typical of the Black Hills area. Mountain mahogany, grama grasses, *Rhus trilobata*, the *Opuntias*, and ricegrass were also growing on the site when it was recorded.

The approximately one-half-acre site consists of three circular structures, manos, metates, debitage, and chipped-stone tools that include projectile points and biface diagnostics. Feature 1 is a circular stone structure made of sandstone slabs, with a single upright slab (Figure 3.96). The structure is approximately 5 x 4 m in diameter. The structure can be typed to Kalasz's (1989) Class V, contiguous rock walls, isolated unit; however, the north and northeastern portion of the structure may have spaced walls.

Feature 2 is a semicircular structure made of sandstone slabs. It measures 7.5 x 5 m, and a single upright slab was noted (Figure 3.97). This particular structure was probably fully circular, with the northwest half eroded away. The rocks that comprise this structure are more densely clustered than those in the other structures at the site. A considerable number of artifacts, including diagnostic projectile points and ground stone, were noted eroding out from the structure.

Feature 3 is another semicircular structure made of sandstone slabs. It is located on a small, sandy ledge or bench in the northern part of the site. This structure is also eroding. The rock alignment making up the walls measure 5 x 3 m (Figure 3.98). The rocks of this structure may abut the low bedrock ledge to the northwest, but it is too eroded to be sure.

All three structures from the site appear to be Class V, contiguous rock wall, isolated units. According to Kalasz (1989:102), these architectural features are most closely associated with dates from approximately A.D. 270 to A.D. 1360.

A sample of the chipped-stone debitage around Feature 2 was recorded, and the following analysis provides a reasonable assessment of the lithic reduction strategy employed in that area (Table 3.23). Of the total, 74% is quartzite, 23% is chert, 1% is chalcedony, 1% is argillite, and 1% is hornfels/basalt. Of the quartzite debitage, 81% is the large size grade, while the remaining 19% is small; 32% of the debitage had cortex and 68% is noncortical; and 72% is recorded as simple flakes, 22% as complex flakes, and 6% is shatter. Of the chert debitage, 44% is large and 56% is small; 31% is cortical and 69% is noncortical; and 44% is classified as simple, 19% as complex, and 36% is shatter.

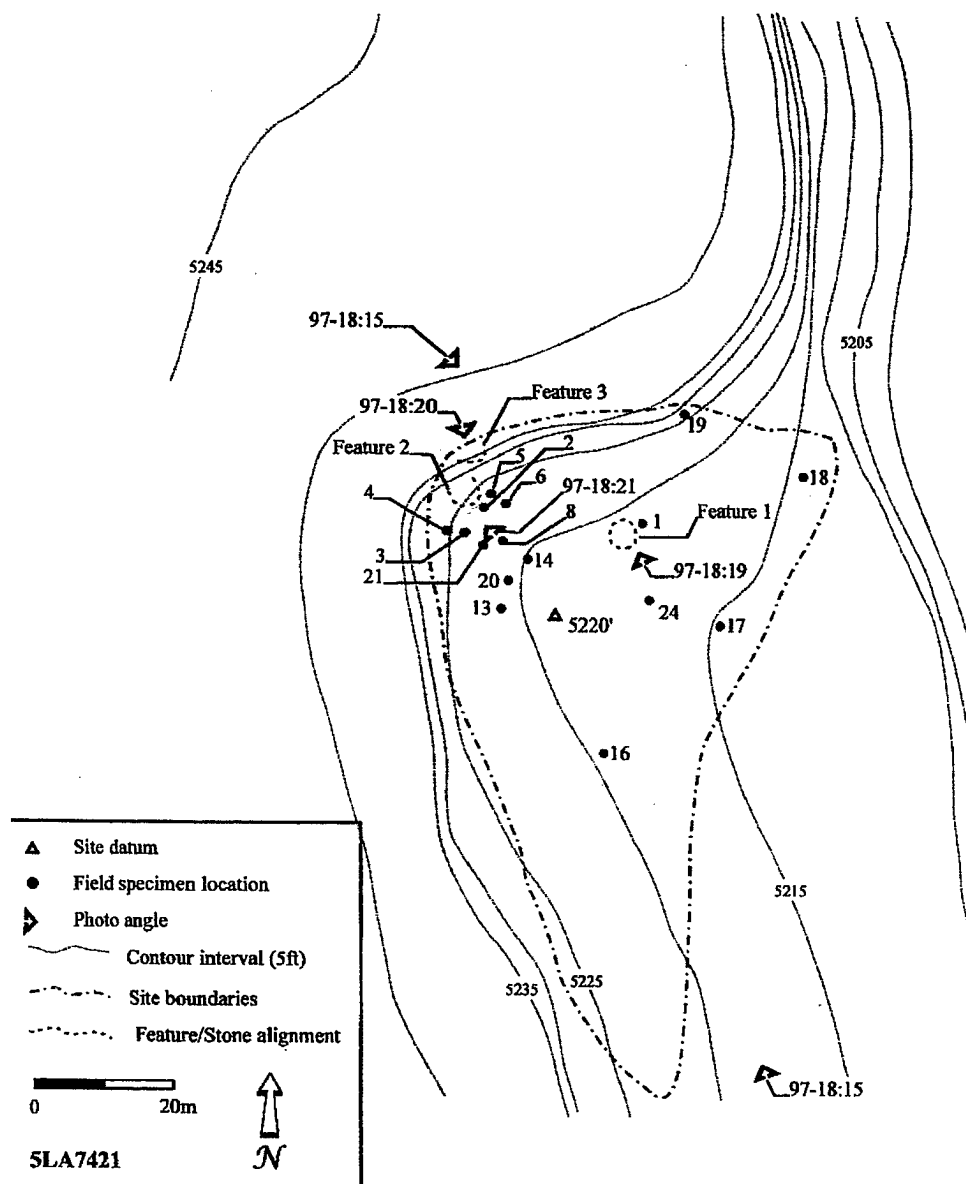


Figure 3.94: Site map, 5LA7421.

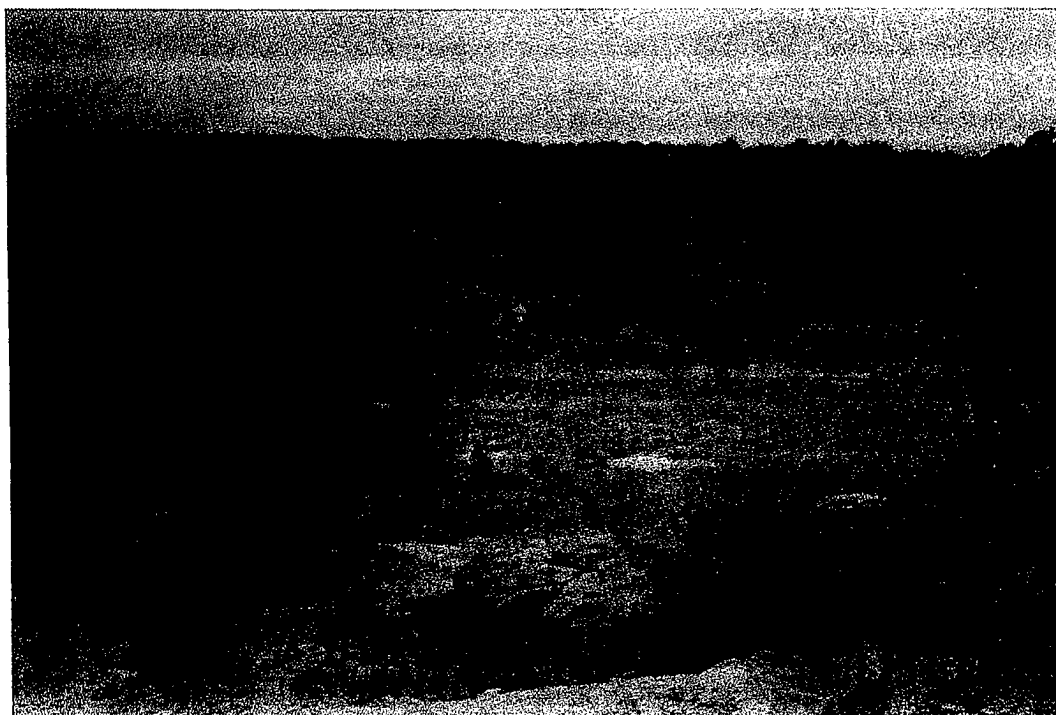


Figure 3.95: Photograph of Site 5LA7421 taken from the rock outcrop on the northwest side of the site.

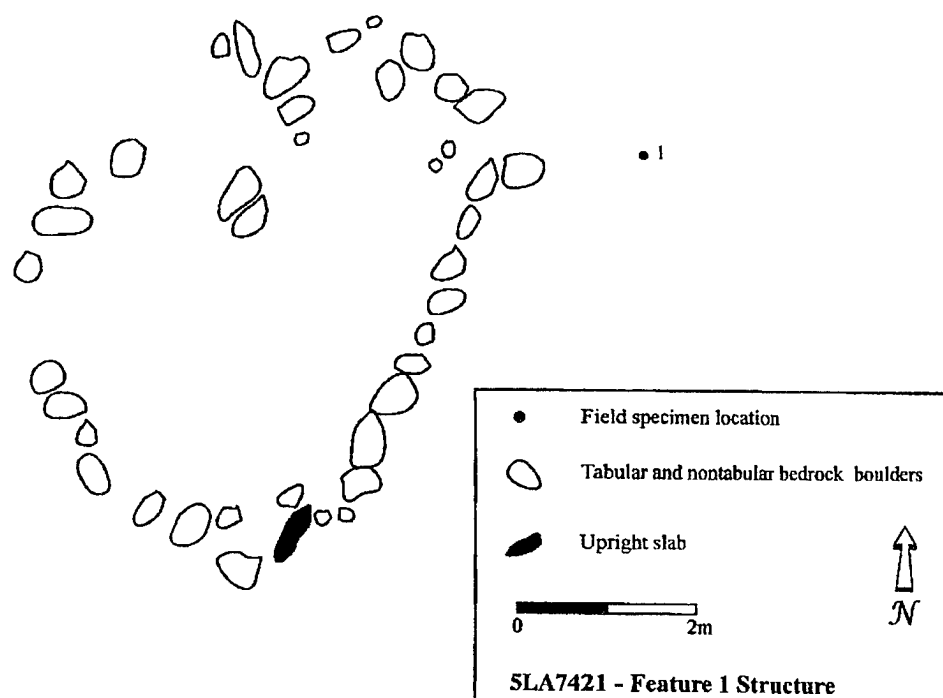


Figure 3.96: Planview of Feature 1, 5LA7421.

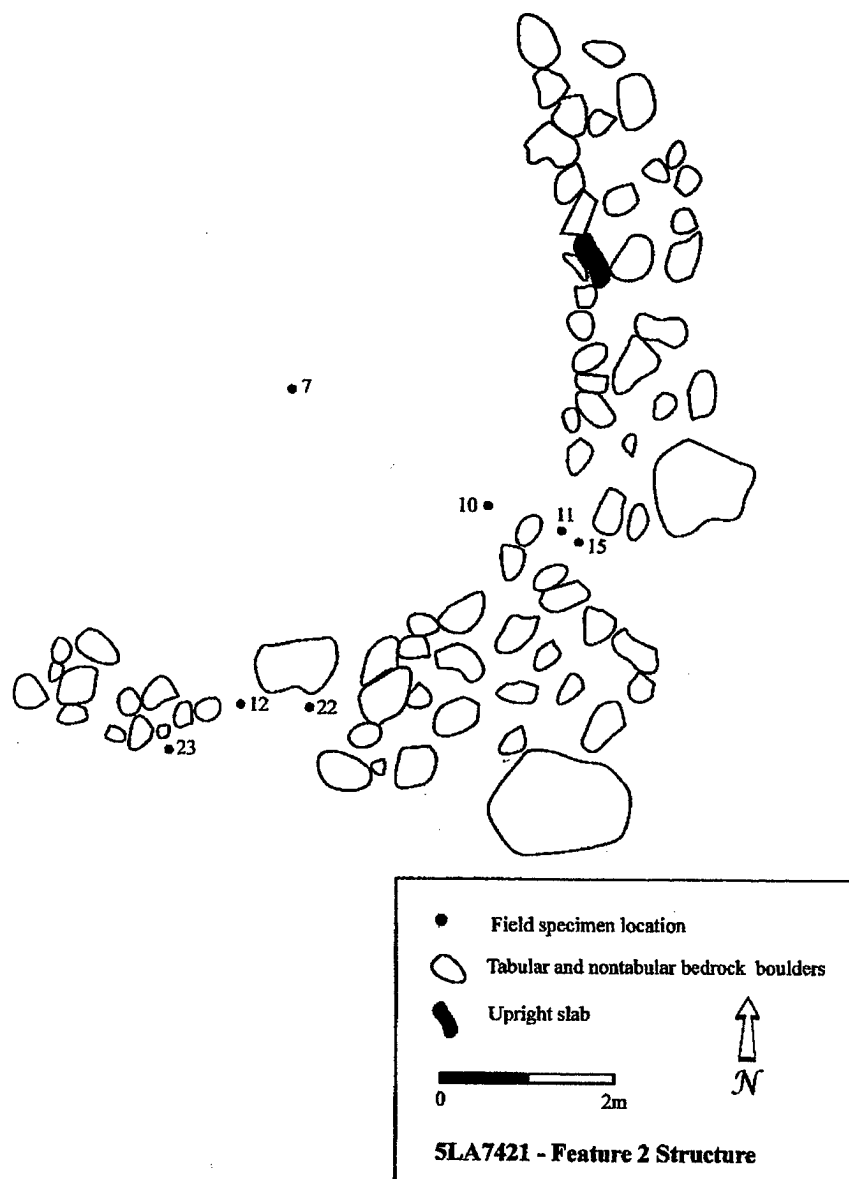


Figure 3.97: Planview of Feature 2, 5LA7421.

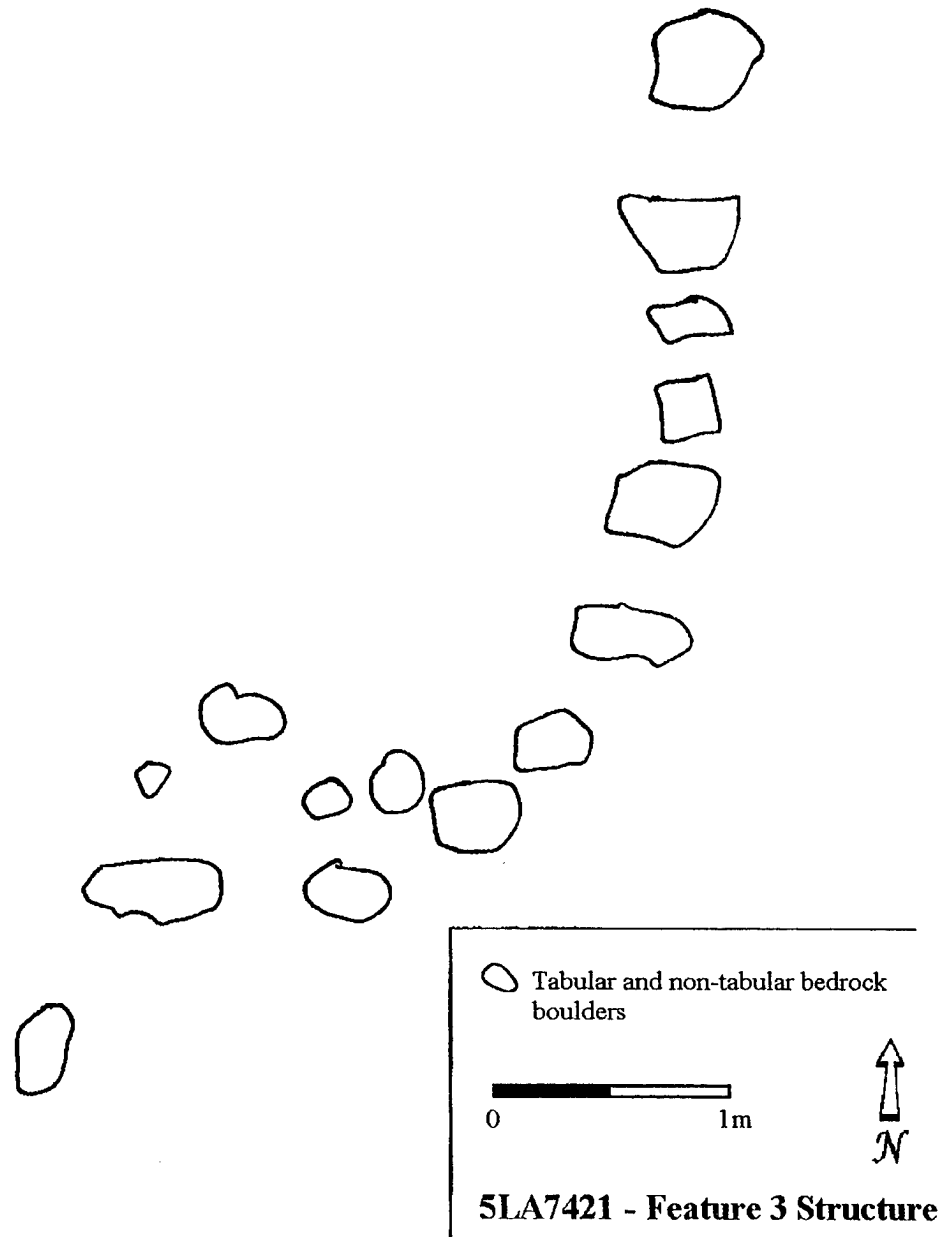


Figure 3.98: Planview of Feature 3, 5LA7421.

Freehand percussion was the most important technique in generating both the quartzite and chert debitage (Figure 3.99). Both quartzite and chert also have relatively high percentages of cortical, small flakes. It is also notable that 36% of the chert flakes are shatter. Based on this data, it is reasonable to suggest that early-stage lithic reduction strategies were responsible for generating both the quartzite and chert debitage in and around Feature 2.

Five diagnostic projectile points were recovered from the site. They are all closely associated with the structures (particularly Features 1 and 2). All are relatively late (Table 3.24) and suggest the site was occupied at some time during either the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500) or the Late Ceramic stage (A.D. 1500 to A.D. 1750).

The tool assemblage consists of ten artifacts. Of these, four are bifaces, two are unifaces, two are utilized flakes, one is an end scraper, and one is a non-bipolar core. Of the bifaces, two of the four specimens are broken. Two are coarse-grained quartzite, one is "Tiger eye" chert, and one is argillite. "Tiger eye" chert is not local; it comes from the area of Rangely, Colorado, and, therefore, probably represents an exchange item. Reduction stages for the bifaces are unfinished (2), nearly finished (1), and finished (1). Only the finished chert specimen shows use wear, which is seen on the acute (<45 degree) lateral edges. Both uniface tools are coarse-grained quartzite and classified as unfinished. One specimen is not utilized, and the other exhibits light scraper usage on the distal end. The utilized flakes are complete. The siltstone specimen is classified as finished and shows light use wear on the acute right lateral edge and distal end. The quartzite specimen is also finished and exhibits light cutting wear on the left lateral edge. The end scraper is complete and made of chert. This specimen is classified as finished and displays moderate use wear on the distal end only. The non-bipolar core is quartzite.

Five pieces of ground stone were recorded at the site. Four of these are manos, three of which were found in close proximity of Feature 2. All but one of the manos is made of sandstone, with the exception made from quartzite, and all of them have two surfaces that exhibit evidence of pecking and grinding. The single flat metate was located approximately 5 m south-southeast of Feature 1. It is made from sandstone, with evidence only of grinding. The high frequency of ground stone suggests that plant processing was an important activity.

Table 3.23: Summary Description of Chipped-Stone Debitage for 5LA7421.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Quartzite
Total flakes	2	2	36	2	118
Small	1	2	20	1	23
Large	1	0	16	1	95
Cortical	0	0	11	1	38
Noncortical	2	2	25	1	80
Simple	2	1	16	2	85
Complex	0	1	7	0	26
Shatter	0	0	13	0	7
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0

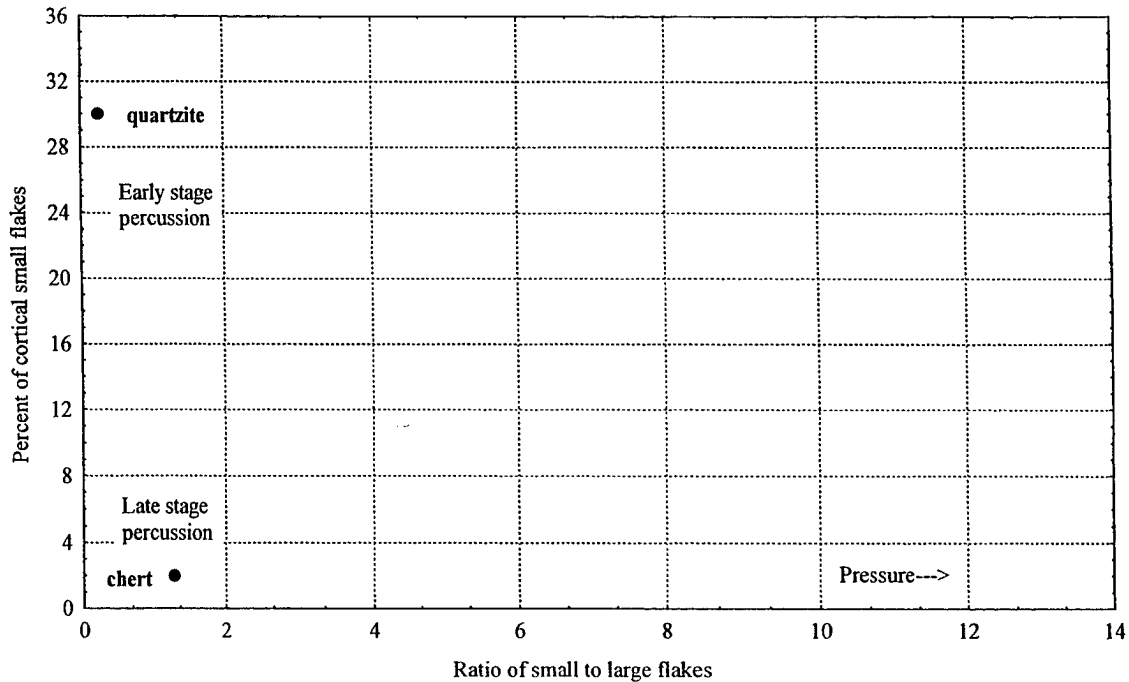


Figure 3.99: Plot of the chert and quartzite debitage from 5LA7421.

Table 3.24: List of Temporally Diagnostic Projectile Points from 5LA7421.

Field Specimen No.	Catalogue No.	Anderson (1989) Type	Start Date Years A.D.	End Date Years A.D.
2	7421.0.2	P66	800	1450
3	7421.0.3	P83	750	1650
4	7421.0.4	P85	1000	1400
5	7421.0.5	P79	1000	1750
15	7421.0.14	P49	800	1750

We recommend this site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7421 is a lithic scatter and structure/habitation site with a high ground-stone count and areas of high artifact density. The density of ground stone around Feature 2 indicates that plant processing was carried out at this location. The feature is partially destroyed, and a number of artifacts were eroding out of the structure. Some deposits of up to approximately 20-30 cm are still in the preserved portion of the feature and they indicate a good probability of finding intact cultural deposits that would include pollen and macrobotanical remains. Test excavations in Feature 2 would yield important data for the reconstruction of subsistence patterns and/or paleoenvironment. The presence of "Tiger eye" chert also suggests that further work at the site may yield more non-local raw materials useful in reconstructing trade and exchange networks. We suggest that the site be revisited for more detailed mapping and a thorough surface collection. Features 2 and 3 should be excavated not only because of the potential for recovering important data, but also because they are eroding away and in danger of being destroyed.

5LA7438

This site consists of a scatter of chipped-stone tools, debitage, and pottery sherds located on the gradual, south-trending slope of the south side of a ridge separating Sugarloaf from Welsh Canyon (Figures 3.100 and 3.101). The slope is broken by unnamed, south-to-southwest flowing drainages that drain down the slope into an unnamed stream that ultimately flows south into Stage Canyon. The site is situated toward the southern edge of one of these smaller drainages. The site datum is at an elevation of approximately 1,537 m (5,042 ft) asl. Topographic relief at the site is nominal, with a slight drop off in the southeast corner.

The artifacts are most densely concentrated to the south of the site datum, on a very slight rise, where animal disturbance has exposed chipped-stone tools and ceramics. Feature 1 is an area of ash and thermally altered rocks measuring approximately 3 m in diameter and is adjacent to the lithic concentration.

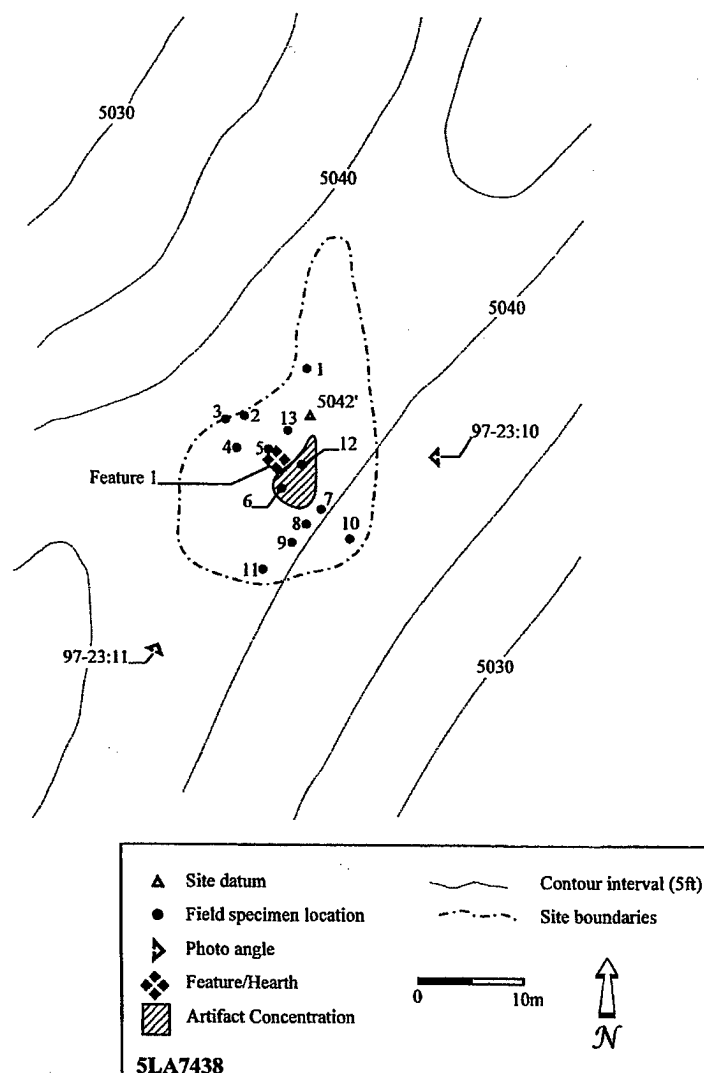


Figure 3.100: Site map, 5LA7438.

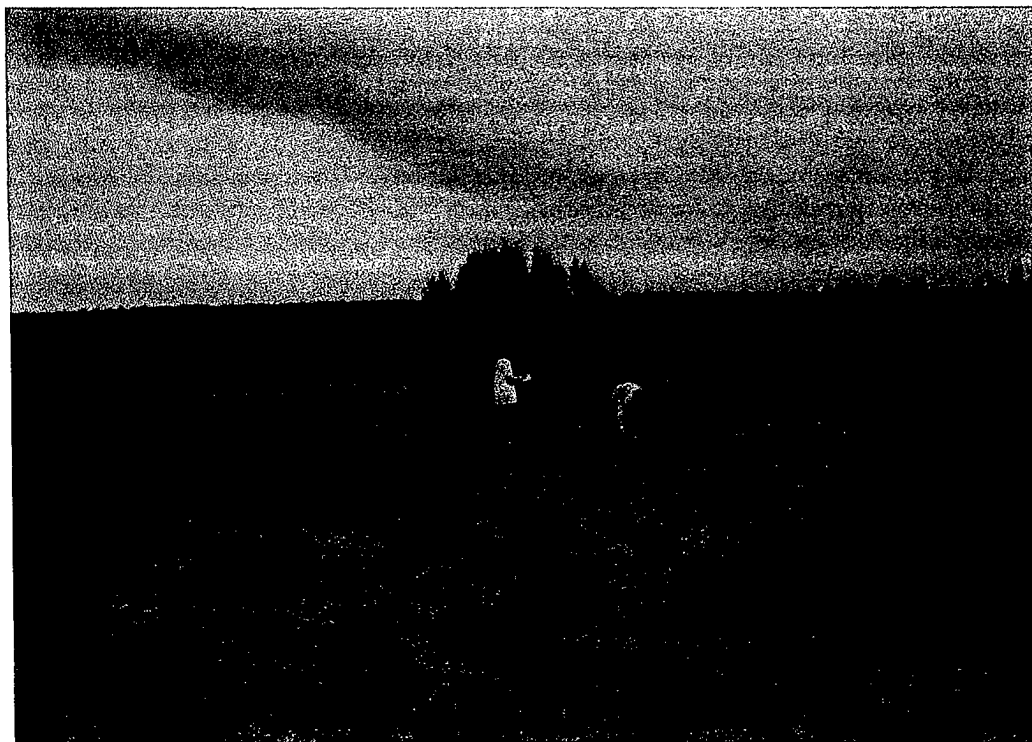


Figure 3.101: Overview of 5LA7438 at 30° upslope.

Juniper, cholla, grama grass, *Opuntia*, and other assorted grasses grow on the site, which is relatively small and concentrated. Its area is calculated at .201-acres in the juniper scrub vegetative community typical of most of the Black Hills.

A total of 153 pieces of chipped-stone debitage were recorded (Table 3.25). Of the total, 74% is quartzite, 21% is chert, 5% is hornfels/basalt, and 1% is argillite. Of the quartzite debitage, 48% is the large size grade, while the remaining 52% is small; 42% of the debitage has cortex and 58% is noncortical; and 85% is recorded as simple flakes, 12% as complex flakes, and 4% is shatter. Of the chert debitage, 25% is large and 75% is small; 9% is cortical and 91% is noncortical; and 69% is classified as simple, 16% as complex, and 16% is shatter.

Apparently freehand percussion was the most important technique in generating both the quartzite and chert debitage, but a moderately high count of small chert flakes may suggest that some pressure flaking also occurred (Figure 3.102). Based on the available data for the site, it appears that quartzite debitage was generated by the later stages of lithic reduction, while the chert debitage was likely the result of tool manufacture or maintenance.

Two diagnostic projectile points were found at the site. These two specimens (5LA7438.0.3 and 5LA7438.0.8) resemble Anderson's (1989) P49 type and have associated dates of between A.D. 800 to A.D. 1750. Based on these artifacts, the site may have been occupied during the Middle to Late Ceramic stage (A.D. 800/1000 to A.D. 1750).

Table 3.25: Summary Description of Chipped-Stone Debitage for 5LA7438.

	Argillite	Chert	Hornfels/Basalt	Quartzite
Total flakes	1	32	7	113
Small	0	24	2	59
Large	1	8	5	54
Cortical	0	3	1	47
Noncortical	1	29	6	66
Simple	0	22	5	96
Complex	1	5	1	13
Shatter	0	5	1	4
Bifacial-thinning	0	0	0	0
Bipolar	0	0	0	0

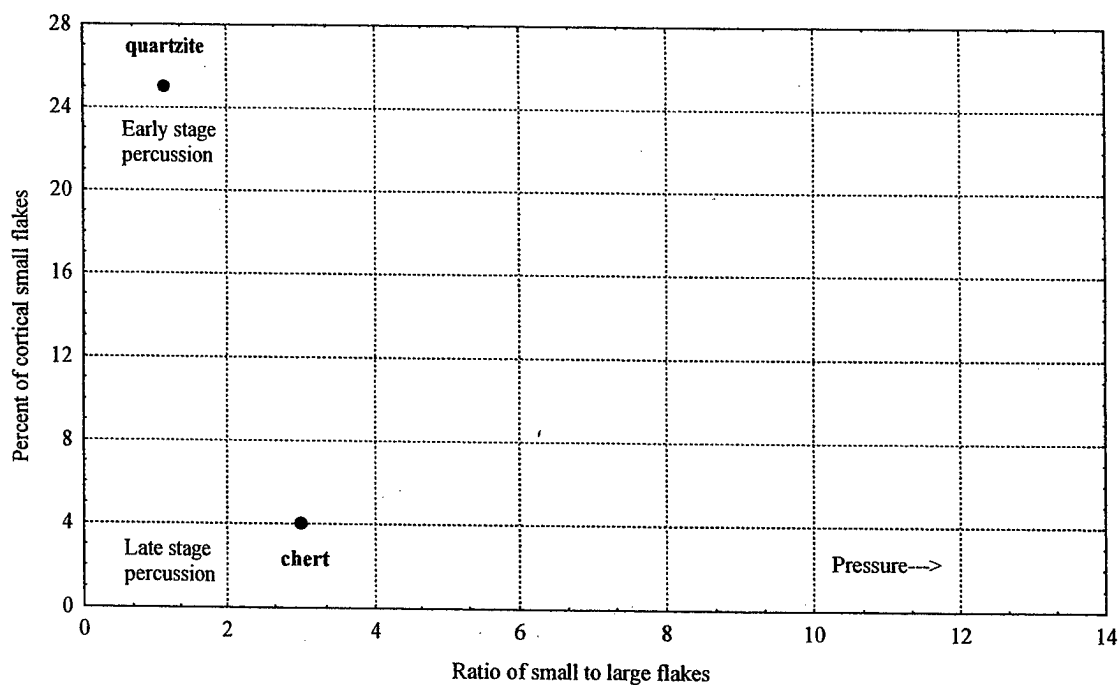


Figure 3.102: Plot of the chert and quartzite debitage from 5LA7438.

The tool assemblage consists of one quartzite non-bipolar core, one complete chert uniface, one complete coarse-grained quartzite biface, and one chert drill bit fragment. The uniface tool is classified as nearly finished and displays moderate use wear on the steep left lateral edge. The drill specimen is finished and shows retouch modification and heavy use wear on both lateral edges of the bit. The biface is classified as unfinished, with no visible use wear noted.

A flat sandstone metate with one ground surface was found approximately 5 m southwest of the site datum. Two pieces of unidentified shell (FS 8) were also noted.

Eighteen body sherds from a single vessel were recovered from the area around Feature 1. The vessel exhibits parallel and partly obliterated cord marks on its exterior surface (Appendix II). Because so few rim sherds were recovered, the vessel's form is undetermined.

We recommend that the site be determined eligible for the National Register because it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7438 is a lithic scatter with a thermal feature (Feature 1) that may be a hearth or midden area. The area around Feature 1 also exhibits considerable deposition (up to perhaps 50 cm). The site is somewhat small, measuring only approximately 0.2-acres; yet the artifact count was high. There is a good probability of finding intact cultural deposits that may include pollen and macrobotanical remains. We suggest that the site be revisited for more detailed mapping and a more thorough surface collection. Test excavations in or near Feature 1 will likely yield important data for the reconstruction of subsistence patterns and/or paleoenvironment. Several temporally diagnostic artifacts useful for addressing issues about chronology, such as projectile points and ceramics, were located and they indicate the possibility of more in buried context.

5LA7443

The site is a lithic scatter with two rockshelters located along the southern boundary of the Black Hills near a north-to-south trending tributary to Welsh Canyon. The 2.7-acre site is located on the top of a hill and on the slopes around and within a large rock outcropping (Figure 3.103). A rather steep drop off is located along the eastern side of the site, while a gentler slope is found on the west. The datum is at approximately 1,551 m (5,090 ft) asl, and the site slopes down an additional 5 m.

The site is located in the juniper scrub vegetative community typical of the Black Hills. Along with juniper, prickly pear, cholla, grama grasses, *Rhus trilobata*, and yucca were seen growing on the site when it was recorded. Soils are relatively thin, with most under 10 cm deep.

Two rock shelters (Figure 3.106) are located in the outcroppings near the center of the site. The first rockshelter (Feature 1) measures 4.4 x 1.5 m and has an area of burned bone, thermally altered rocks, and ground stone (FS 1) out in front (Figure 3.104). The second rockshelter (Feature 2) measures 4.4 x 2 m (Figure 3.105).

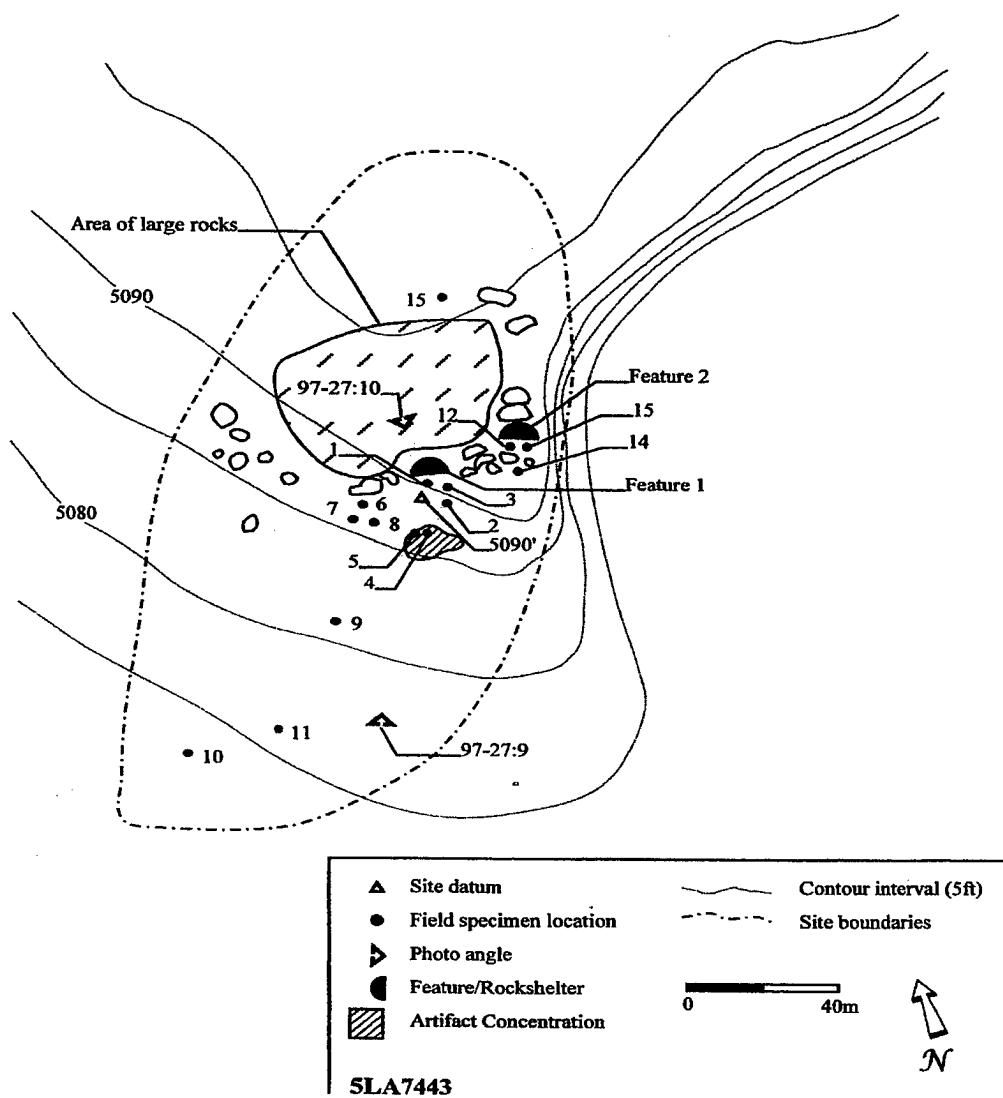


Figure 3.103: Site map, 5LA7443.



Figure 3.104: Overview of Site 5LA7443 toward rockshelter (Feature 1).

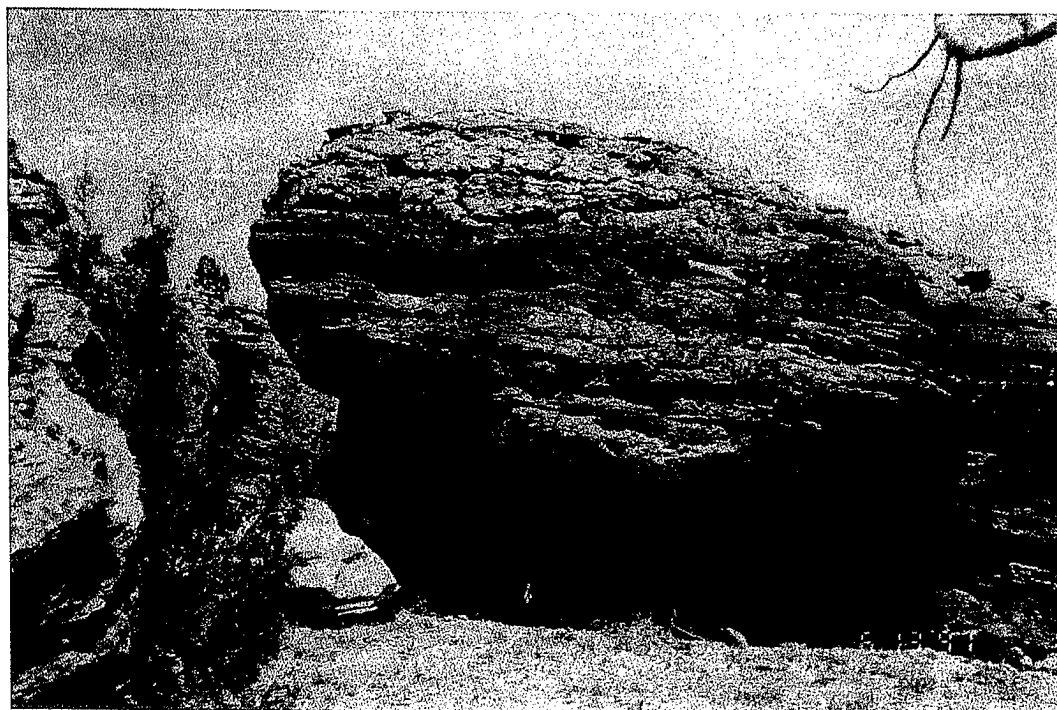


Figure 3.105: Feature 2, view facing north.

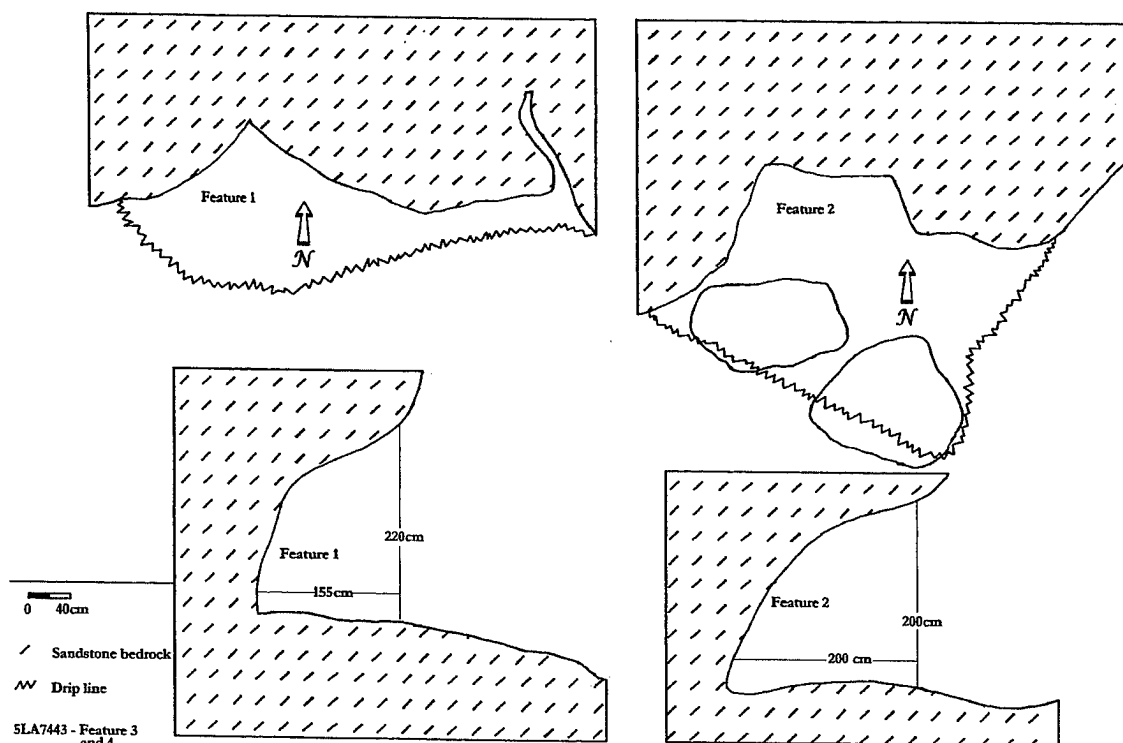


Figure 3.106: Planview and cross-section maps for Features 1 and 2, 5LA7443.

A total of 159 pieces of chipped stone were recorded from the site (Table 3.26). Of the total debitage, 82% is quartzite, 17% is chert, 1% is argillite, and 1% is hornfels/basalt. Of the quartzite debitage, 69% is the large size grade, while 32% is recorded as small; 38% of the debitage is noncortical and 62% has cortex; and 22% is recorded as complex flakes, 8% as shatter, and 69% as simple flakes. Of the chert debitage, 48% is the large size grade, while 52% is small; 56% of the debitage is noncortical and 44% has cortex; and 30% is recorded as complex flakes, 15% as shatter, 48% as simple flakes, and there was one bipolar flake and bifacial-thinning flake.

Figure 3.107 shows a scatter plot of the quartzite and chert debitage. Based on the plot, it appears that freehand percussion was likely the most important technique in generating both the quartzite and chert debitage. The plot also suggests that the earlier stages of quartzite lithic reduction were likely carried out at the site. According to the plot, the earlier stages of chert lithic reduction were also carried out at the site. It should be cautioned that the count of small chert flakes is low (14) and the results may be somewhat skewed. This interpretation is partly supported by the relatively high percentage of shatter and the presence of a bipolar flake. The presence of a single bifacial-thinning flake may suggest that some work on bifaces was conducted at the site. The counts of the remaining material types are too low for meaningful analysis.

Only one diagnostic projectile point was recovered at the site. This specimen resembles Anderson's (1989) P49 type and has associated dates of between A.D. 800 and A.D. 1750. Based on this artifact, it can be inferred that the site was occupied at some time during either the Middle or Late Ceramic stages (A.D. 800/1000 and A.D. 1750).

Table 3.26: Summary Description of Chipped-Stone Debitage for 5LA7443.

	Argillite	Chert	Hornfels/Basalt	Quartzite
Total flakes	2	27	2	130
Large	1	13	1	89
Small	1	14	1	41
Noncortical	1	12	2	49
Cortical	1	15	0	81
Bifacial thinning	0	1	0	0
Bipolar	0	1	0	0
Complex	0	8	1	28
Shatter	1	4	0	8
Simple	1	13	1	94

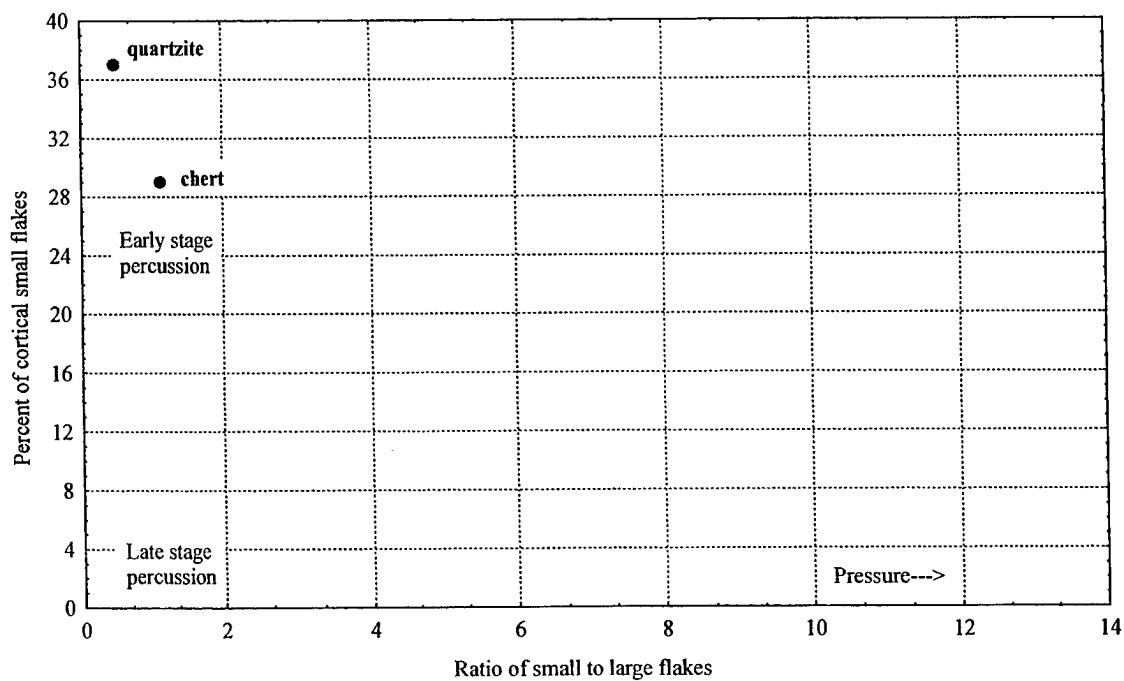


Figure 3.107: Plot of the chert and quartzite debitage from 5LA7443.

The stone-tool assemblage consists of nine artifacts, of which three are bifaces, three are retouched uniface tools, two are non-bipolar cores, and one is a side scraper. Of the bifaces, two of the three specimens are broken and all are chert. All three reduction stages are represented. None of the specimens display visible use wear. As a group, all of the uniface tools are classified as nearly finished. The argillite specimen is broken and exhibits light use wear along the remaining steep edge. The fine-grained quartzite specimen is complete and displays light scraper usage along the left lateral edge and the distal end. The chert specimen shows distinct retouch modification with no visible use wear. The side scraper is made of chert and is complete. This specimen is classified as finished, with moderate to heavy use wear and retouch modification seen on both lateral edges. Of the non-bipolar cores, one is chert and one is fine-grained quartzite.

Two pieces of ground stone (both manos) were recorded at the site (FS 1 and 10). One mano (FS 1) was recovered in front of Feature 1, is made from basalt, and measures 4.6 x 8 x 5.5 cm. The second mano (FS 10), located in the southwest corner of the site, measures 2.6 x 7.6 x 6.5 cm. Less than 50% remained from the two manos.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Even though the site exhibits rather shallow deposition, there is a dense artifact concentration in the vicinity of the rockshelters. Artifact counts and density were high, and several tools were identified as well as the broken remains of potentially diagnostic artifacts. The presence of ground stone and the midden-like deposit in front of Feature 1 also indicate the potential of locating pollen and macrobotanical data. The presence of two Alibates chert tools is potentially useful for reconstructing exchange networks. We recommend that the site be revisited for more detailed mapping and thorough surface collection. The area within Feature 1 and the midden-like area are good candidates for testing to determine whether there are subsurface cultural deposits.

5LA7448

The site is a lithic scatter with two rockshelters and associated rock art (Figures 3.108 and 3.109). The site is located on the east side of the northernmost tributary of Welsh Canyon. The 0.7-acre site extends from the ridge top down into the drainage, approximately 5 m below. The site datum is at approximately 1,585 m (5,200 ft) asl.

The site is located in the juniper scrub vegetative community typical of the Black Hills. Along with juniper, grama grasses were growing on the site when it was recorded. Soils are relatively thin, with most of the soils between 5 and 10 cm deep; however, deposits of up to approximately 30 cm are found in the rockshelters.

This site includes two rockshelters (Figures 3.110 and 3.111) with associated artifacts. Feature 1, the larger of the two, also has associated rock art (Figure 3.112) in the form of a figure enclosed in a circle pecked through the rock patina (Panel 1, Feature 3).

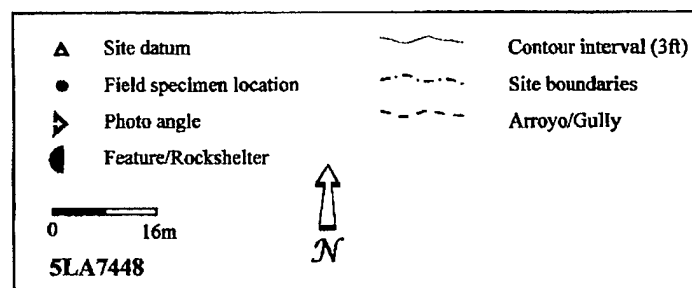
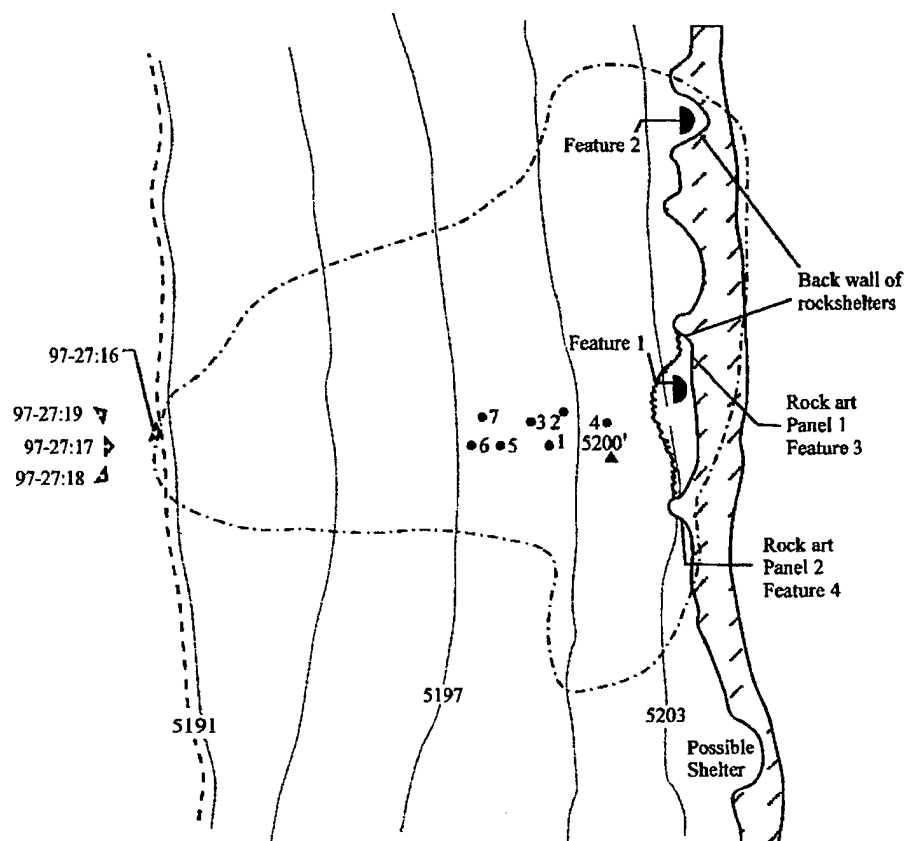


Figure 3.108: Site map, 5LA7448.

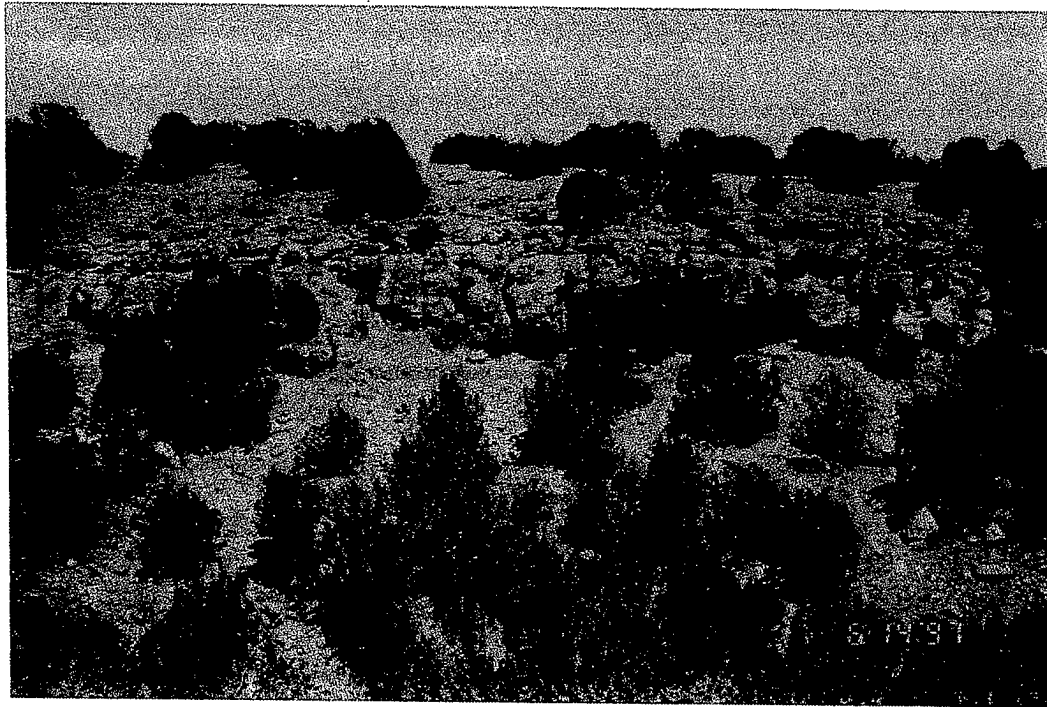


Figure 3.109: Overview of Site 5LA7448 from opposite side of drainage facing 95° east.

On the south side of the rockshelter, there is a second rock art panel (Panel 2, Feature 4). The panel (Figure 3.113) consists of two circles, one inside the other, with lines coming out of the bottom and lower right of the outside circle. There is a long flat piece of sandstone propped up to the west of the rock art. The second rockshelter (Feature 2), although it has artifacts associated with it, is much smaller, particularly in the height of its roof. It is filled with washed-in debris, droppings, and other soils. A third possible rockshelter is approximately 30-40 m downstream of Feature 1, but in the absence of artifacts, it has been excluded from the site limits.

A total of 160 pieces of chipped stone were recorded from the site (Table 3.27). Of the total debitage, 76% is quartzite, 12% is chert, 8% is hornfels/basalt, 3% is argillite, and there is one flake each of chalcedony and silicified wood. Of the quartzite debitage, 79% is the large size grade, while 21% is small; 43% of the debitage is noncortical and 57% has cortex; and 21% is recorded as complex flakes, 10% as shatter, and 69% as simple flakes. Of the chert debitage, 37% falls into the large size grade, while 63% is recorded as small; 63% of the debitage is noncortical and 37% has cortex; and 32% is recorded as complex flakes, 5% as shatter, and 63% as simple flakes.

Figure 3.114 shows a scatter plot of the quartzite and chert debitage. Freehand percussion generated both the quartzite and chert debitage. The plot for quartzite comes out slightly lower in terms of the percent of small, cortical flakes than the average for all the quartzite flakes recorded in our survey. This pattern suggests a mixture of quartzite lithic reduction strategies were employed at the site. A relatively high percentage of quartzite shatter was also noted.

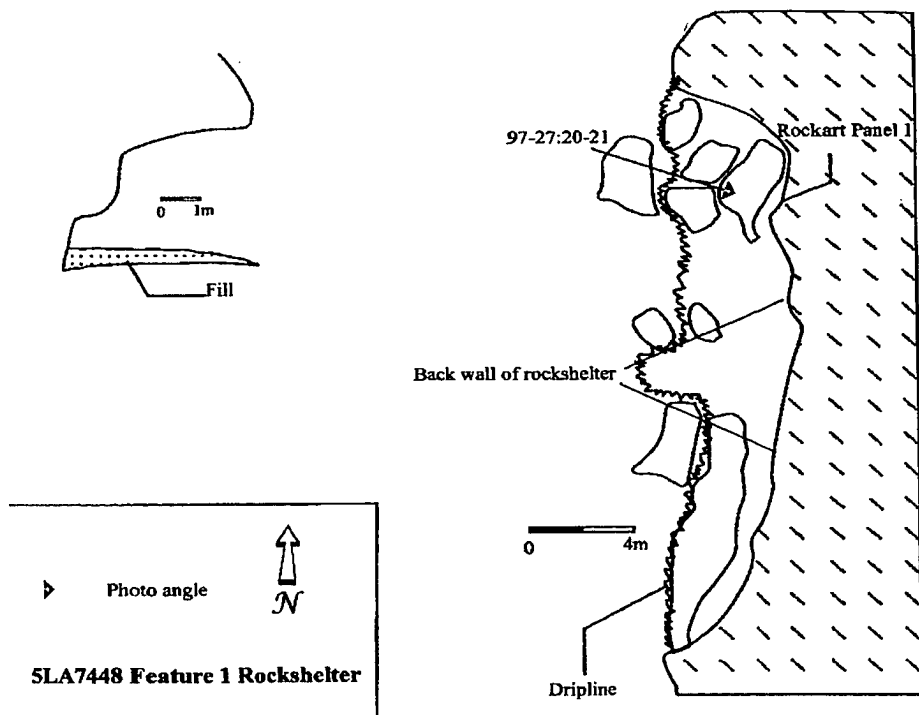


Figure 3.110: Planview and Cross-section of Feature 1, 5LA7448.

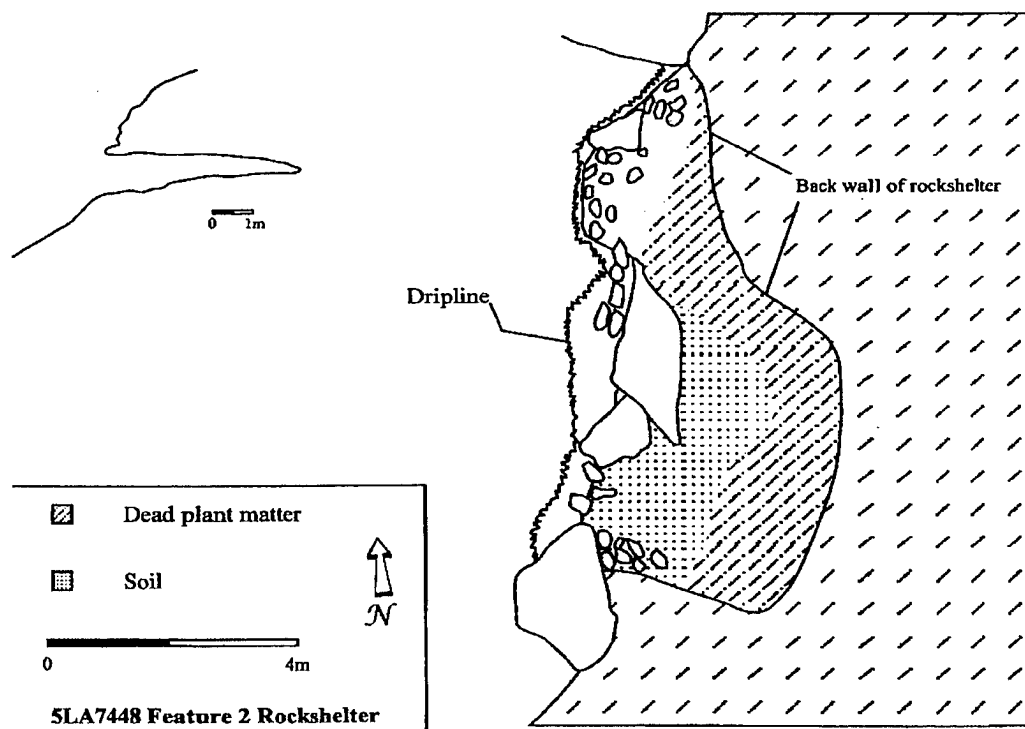


Figure 3.111: Planview and Cross-section of Feature 2, 5LA7448.

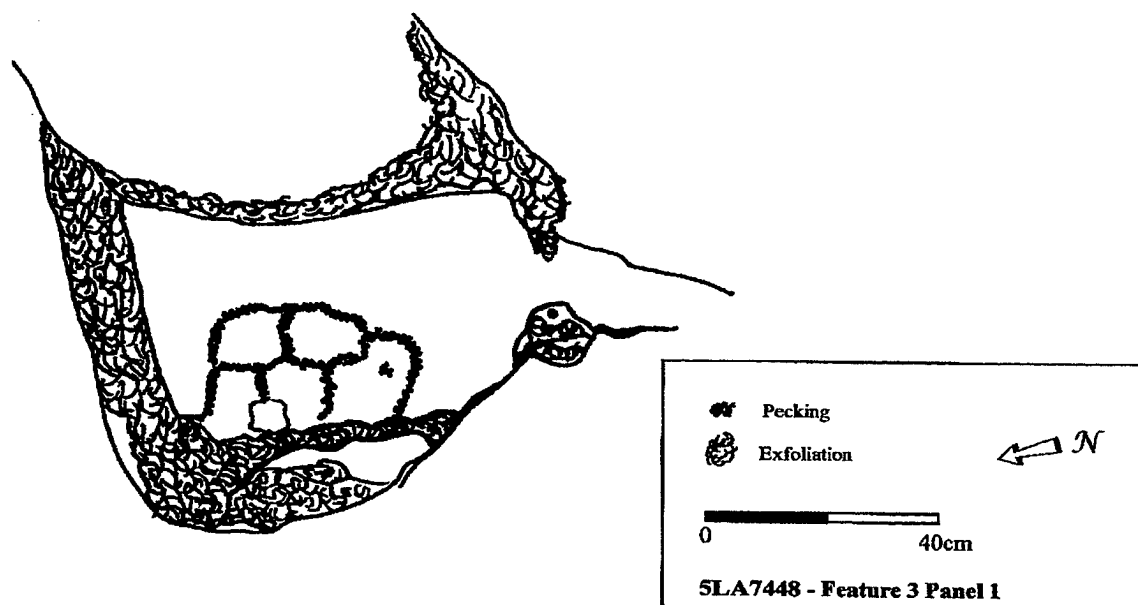


Figure 3.112: Rock art panel 1, Feature 3, 5LA7448.

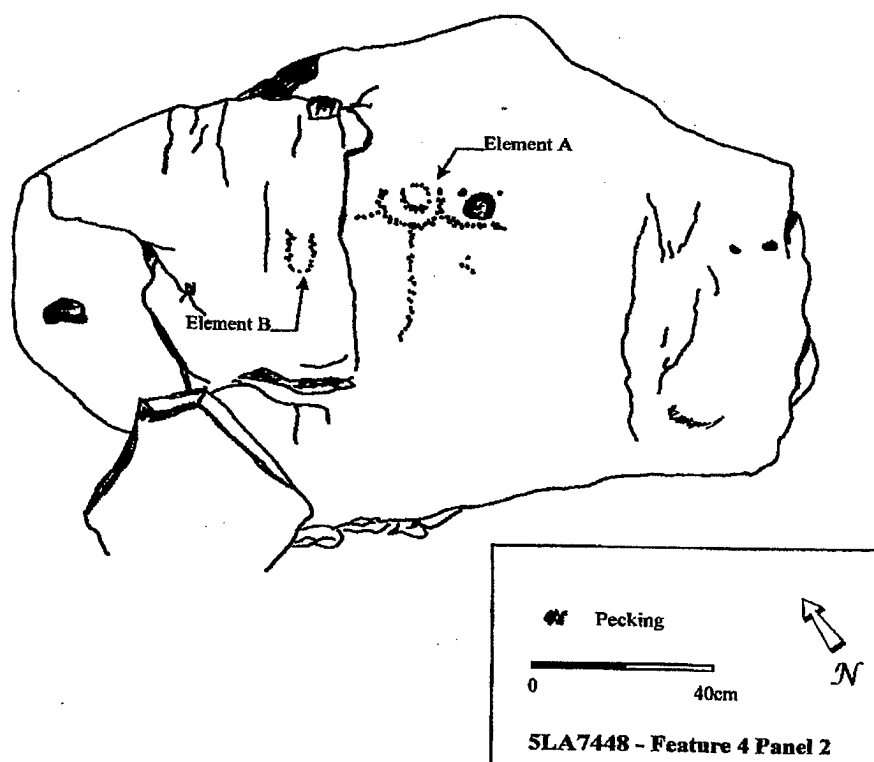


Figure 3.113: Rock art panel 2, Feature 4, 5LA7448.

Table 3.27: Summary Description of Chipped-Stone Debitage for 5LA7448.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Quartzite	Silicified Wood
Total flakes	5	1	19	12	122	1
Large	1	0	7	10	96	1
Small	4	1	12	12	26	0
Noncortical	4	1	12	5	53	1
Cortical	1	0	7	7	69	0
Bifacial thinning	0	0	0	0	0	0
Bipolar	0	0	0	0	0	0
Complex	1	0	6	2	26	0
Shatter	1	0	1	0	12	0
Simple	3	1	12	10	84	1

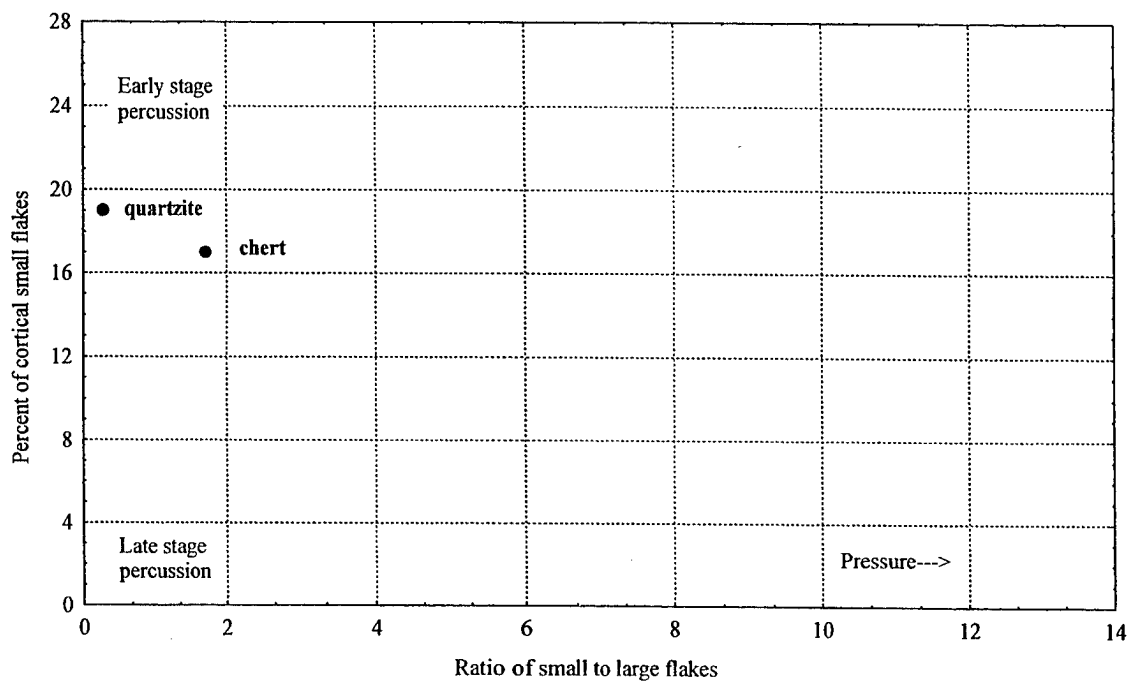


Figure 3.114: Plot of the chert and quartzite debitage from 5LA7448.

According to the plot, the early stages of chert lithic reduction were carried out at the site. It should be cautioned that the count of small chert flakes is low (12) and the results may be skewed. A relatively high percentage of shatter and the presence of four chert cores, all of which were exhausted, also suggest that core reduction occurred at the site. It is possible that the site activities revolved around chert procurement and the initial reduction of chert cores into a more usable lithic product. The counts for the remaining material types were too low for meaningful analysis.

Unfortunately, no diagnostic materials such as projectile points or ceramics were found at the site. Little can be said of how the site fits into the regional chronology. Only a single piece of ground stone (a mano) was recorded at the site (FS 7). It was found approximately 14 m and 220 degrees from the site datum. It was made from hornfels/basalt, had two surfaces, and measured 5.4 x 3.7 cm. Less than 50% of the original piece is preserved.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). The site has at least two rockshelters with evidence of human use (Features 1 and 2). Both have deposits exceeding 30 cm in depth and are associated with a scatter of lithics on the talus slopes below their openings. Through test excavations, the site may yield pollen, macrobotanical data, and faunal remains, all of which can contribute to our understanding of subsistence and paleoenvironment. Two petroglyph panels attest to the potential for the site to contribute to the understanding of the ideology and cosmology of the prehistoric inhabitants of the PCMS. We suggest the site be revisited for more detailed mapping and additional surface collection. The areas within the rockshelters (Features 1 and 2) are good candidates for testing to determine whether there are subsurface cultural deposits.

5LA7452

The site is a large lithic scatter located at the southern edge of the Black Hills. It is situated along a narrow ridge from which there are north-to-south trending drainages into Welsh Canyon. The 4.7-acre site sits on the ridge top overlooking the deep canyon below (Figure 3.115 and 3.116). The site datum is at approximately 1,539 m (5,050 ft) asl. There is little topographic relief in the site area, but its limits extend to the edge of the canyon.

Juniper scrub dominates the area surrounding the site. Juniper, yucca, and grama grasses were seen growing on the site when it was recorded. Soils are relatively thin, with most of the soils between 5 and 10 cm deep.

A total of 176 pieces of chipped-stone debitage were recorded (Table 3.28). Of the total, 68% is quartzite, 20% is chert, 6% is hornfels/basalt, 3% is argillite, and there is one flake each of chalcedony, obsidian, and quartz. Of the quartzite debitage, 73% is the large size grade, 27% is small; 53% of the debitage is noncortical, 47% has cortex; and 32% is recorded as complex flakes, 4% as shatter, and 64% as simple flakes. Of the chert debitage, 44% is the large size grade, 56% is small; 58% of the debitage is noncortical, 42% has cortex; and 19% is recorded as complex flakes, 6% as shatter, 69% as simple flakes, and 6% as bifacial-thinning flakes.

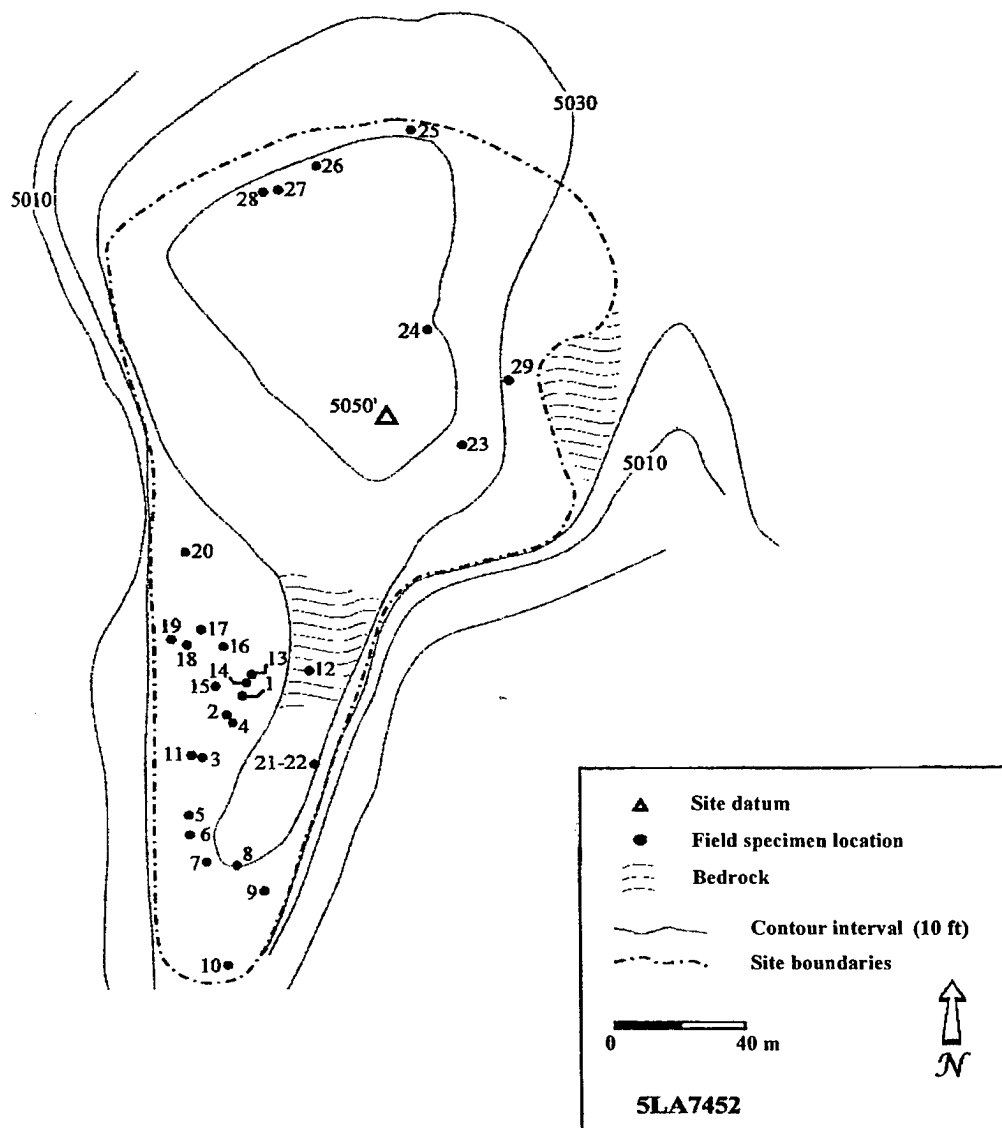


Figure 3.115: Site map, SLA7452.

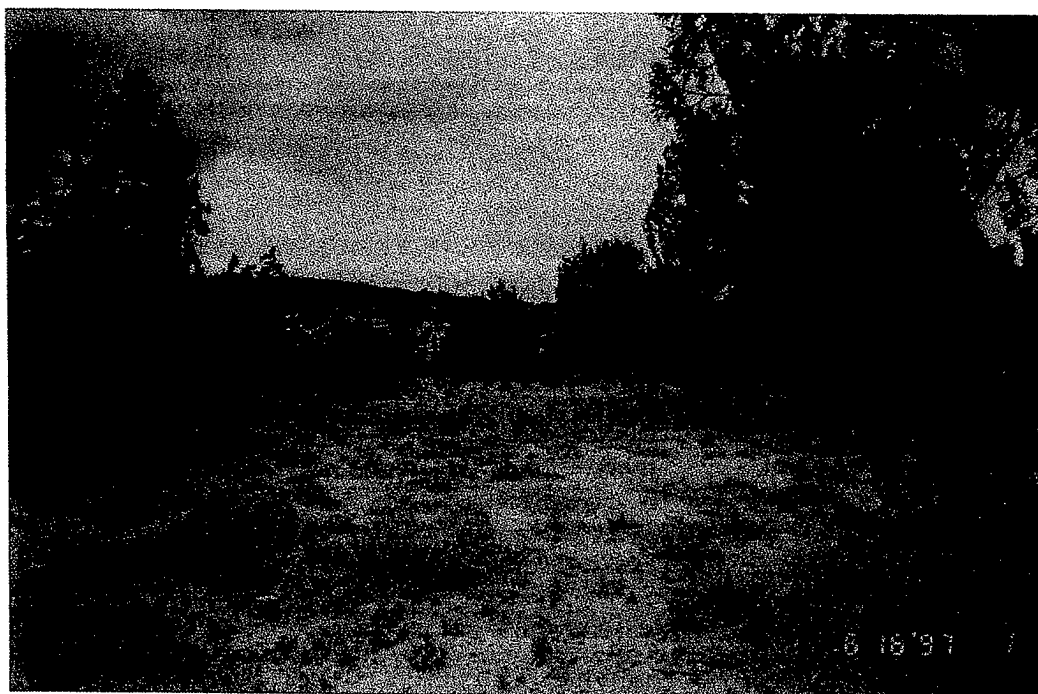


Figure 3.116: Overview looking toward the north end of Site 5LA7452.

Freehand percussion was the most important technique in generating the quartzite and chert debitage (Figure 3.117). The plot for quartzite comes out only slightly lower in terms of the percent of small cortical flakes than the average for all the quartzite flakes recorded in the survey. This pattern suggests that early-stage reduction strategies were employed at the site. Additional support for this inference comes from the presence of seven non-bipolar cores in the assemblage. According to the plot, the earlier stages of chert lithic reduction were also carried out at the site. This is supported by a high percentage of shatter and the presence of two chert cores. The counts for the remaining material types were too low for meaningful analysis.

Two diagnostic projectile points were recorded from the surface of this site. The first point (5LA7452.0.4) is similar to Anderson's (1989) type P7. This type is associated with dates that range between 3000 B.C. and 1000 B.C. The second projectile point (5LA7452.0.7) is a P26 and ranges in time between 1000 B.C. and A.D. 500. Based on these two artifacts, the site likely had occupations in the Middle to Late Archaic stages (3000 B.C. to A.D. 200).

The flaked tool assemblage consists of eleven artifacts. Of these, seven are non-bipolar cores, two are uniface tools, one is a biface, and one is a bifacial core-tool. The majority (6) of cores are quartzite, with the remaining core specimen and the core-tool made of chert. Both uniface tools are broken, classified as finished, and exhibit cutting use wear along acute lateral edges. The fine-grained quartzite specimen exhibits heavy use along the right lateral edge, and the coarse-grained specimen shows moderate use along the left lateral edge. The unfinished biface specimen is fine-grained quartzite and complete, with retouch modification on both faces and no visible use wear.

Table 3.28: Summary Description of Chipped-Stone Debitage for 5LA7452.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Obsidian	Quartz	Quartzite
Total flakes	6	1	36	11	1	1	120
Large	3	0	16	2	1	1	87
Small	3	1	20	9	0	0	33
Noncortical	5	1	21	11	1	0	64
Cortical	1	0	15	0	0	1	56
Bifacial-thinning	0	0	2	2	0	0	0
Bipolar	0	0	0	0	0	0	0
Complex	1	0	7	3	0	0	38
Shatter	0	0	2	0	0	0	5
Simple	5	1	25	6	1	1	77

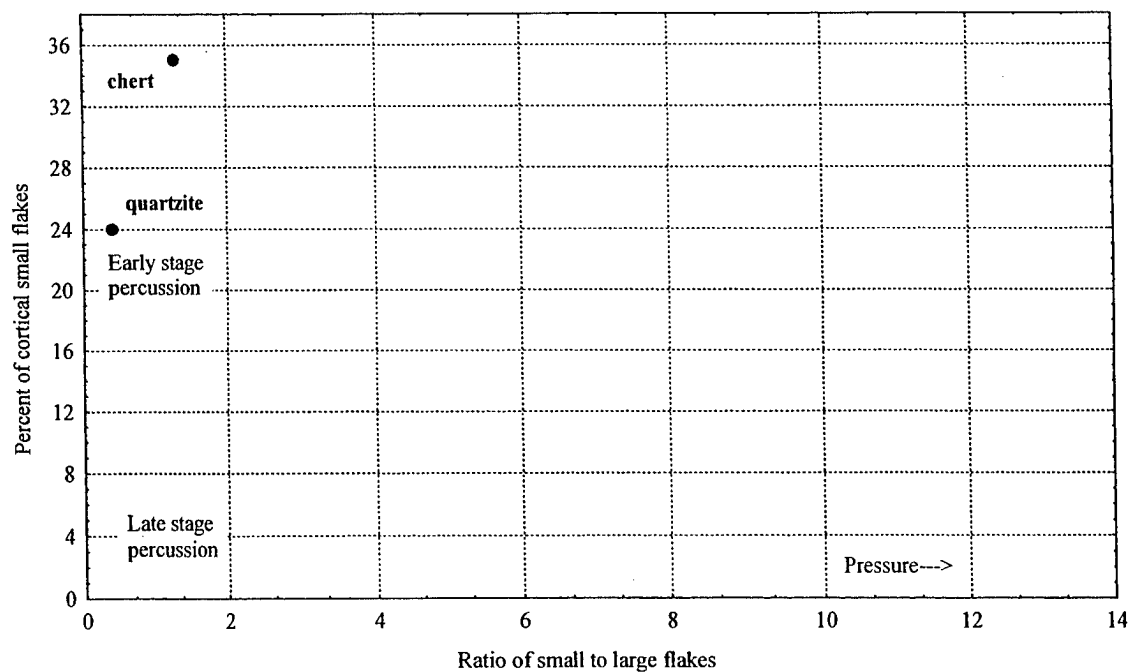


Figure 3.117: Plot of the chert and quartzite debitage from 5LA7452.

Twelve pieces of ground stone were recorded, including nine manos and three metates. One mano (FS 21) was found in a bedrock metate (FS 22). All but one piece of ground stone (FS 28) were found south of the site datum on the ridge overlooking Welsh Canyon. The prevalence of ground stone indicates that plant or food processing was an important activity.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7452 is a large site with a high artifact density. The presence of ground stone indicates that plant processing was an important site activity, and there is a good potential for recovering macrobotanical and/or pollen material from test excavations. The large corner-notched projectile points provide some chronological information and suggest the potential for recovering more useful information. Obsidian was recovered and, even though it was not sourced, can offer data for the reconstruction of trade networks. The one drawback to the site is the lack of substantial soil deposits, but some pockets of sandy loam were noted, and these areas may still hold some buried cultural deposits. We suggest that the site be revisited for more detailed mapping and additional surface collection. Areas where there is potential for intact buried deposits should be noted and test excavations planned accordingly.

5LA7463

This is a lithic scatter and habitation site located at the southern edge of the Black Hills on a large, irregularly shaped ridge that forms a portion of the north side to Welsh Canyon. The 1.6-acre site is situated on a low ridge between two shallow drainages (Figures 3.118 and 3.119). Site 5LA4938 is located just to the north, and the drainage near the edges of the two sites was used as an arbitrary site boundary. It is quite likely that the two sites are very closely related. The site datum for 5LA7463 is at approximately 1,526 m (5,005 ft) asl. The site slopes down to the west and toward the drainages to the north and south. Elevations range from approximately 1,527 m to 1,523 m (5,010 ft to 4,995 ft) asl.

Juniper scrub dominates the area surrounding the site. Juniper, *Rhus trilobata*, mountain mahogany, yucca, prickly pear, grama grass, and cholla were growing on the site when it was recorded. Soils range between 0 and 30 cm. Exposed bedrock is present, especially near the canyon edges and in the shallow drainages. Other areas, especially in the eastern part of the site, have more soil deposition.

The presence of two structures is perhaps the most distinctive characteristic of the site. Feature 1 (Figure 3.121) is located approximately 65 m and 250 degrees from the site datum. It is an isolated structure according to Kalasz's (1989) classification. This structure is comprised of a poorly preserved circular arrangement of sandstone slabs placed in front of a low outcropping of bedrock. The structure measures approximately 3 x 2.6 m, and three upright slabs were noted. Feature 2 (Figures 3.120 and 3.122) is located approximately 61 m and 273 degrees from the site datum. This structure may be composed of two or more rooms, which would make it an agglutinated structure, according to Kalasz's classification. It is also constructed adjacent to an outcropping of sandstone bedrock and measures approximately 8.5 x 5 m.

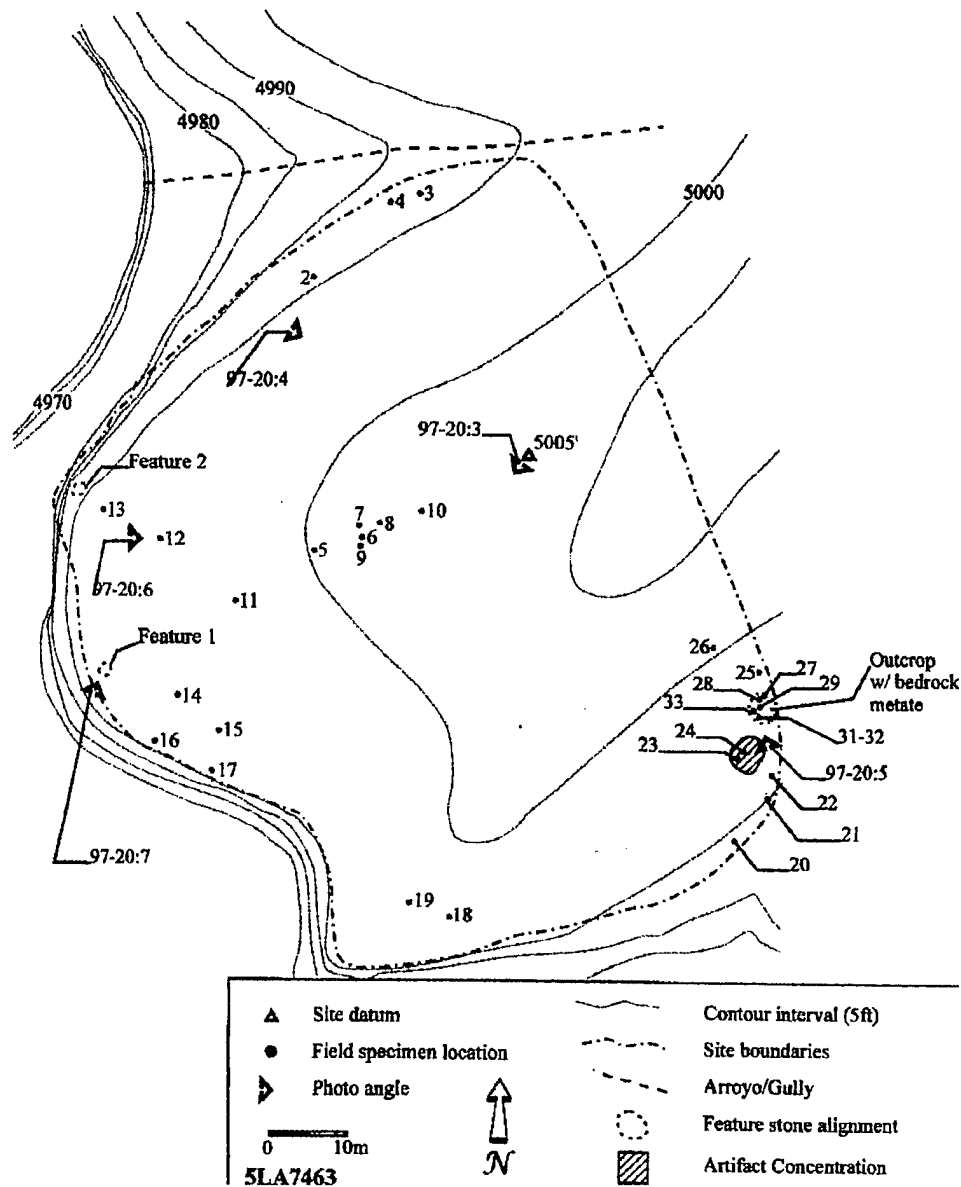


Figure 3.118: Site map, 5LA7463.

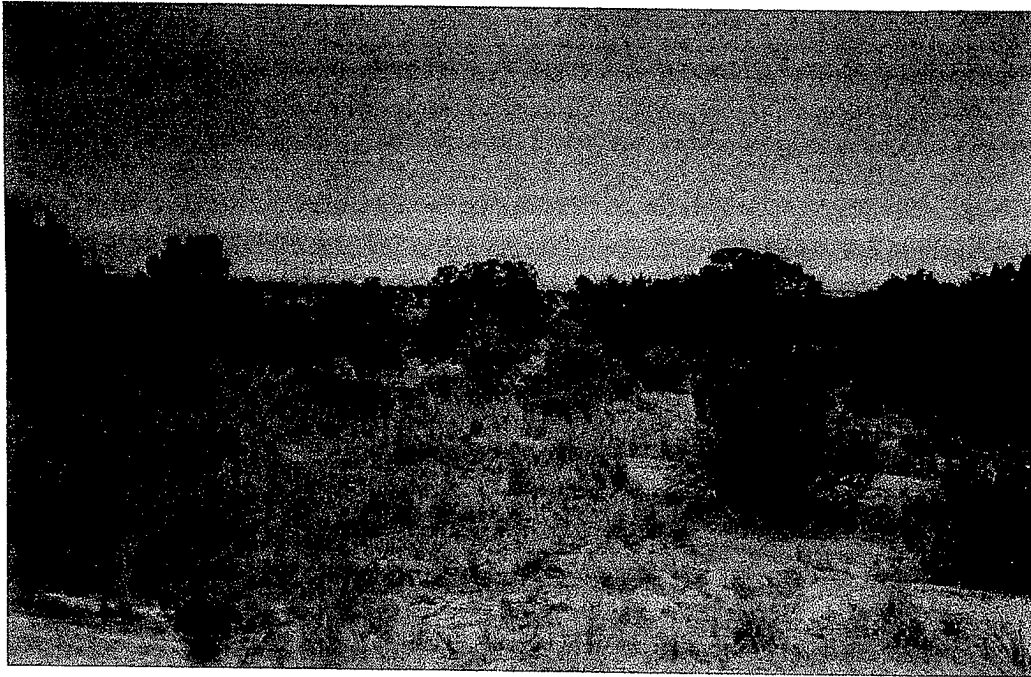


Figure 3.119: View of Site 5LA7463 at datum facing 220° toward Welsh Canyon.

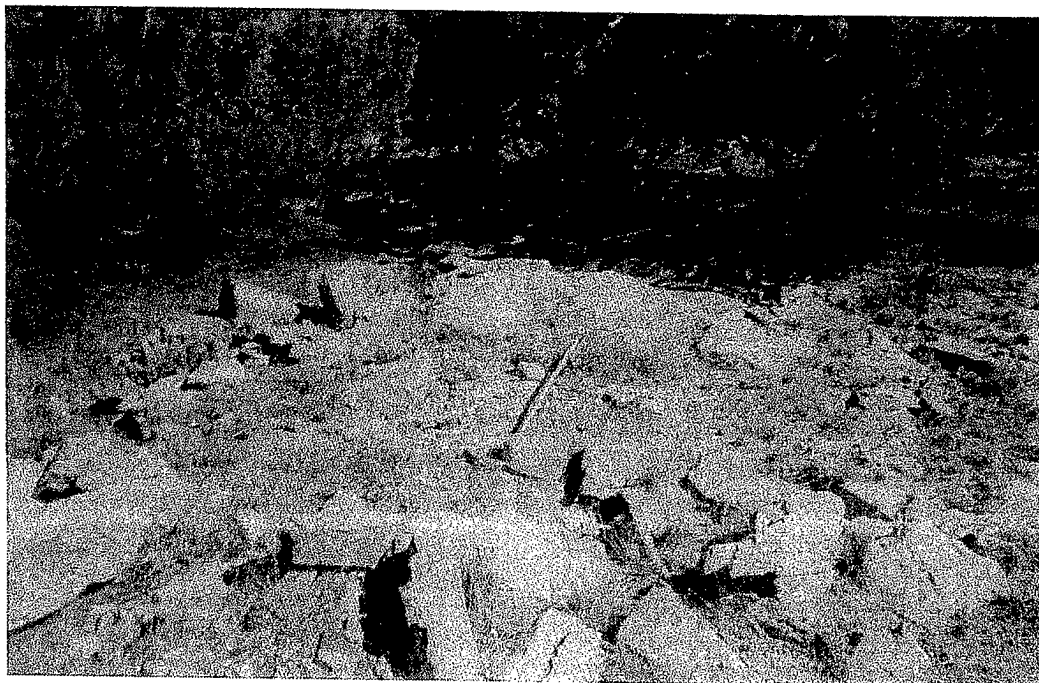


Figure 3.120: Site 5LA7463, Feature 2, circular stone structure. One-meter tape points north.

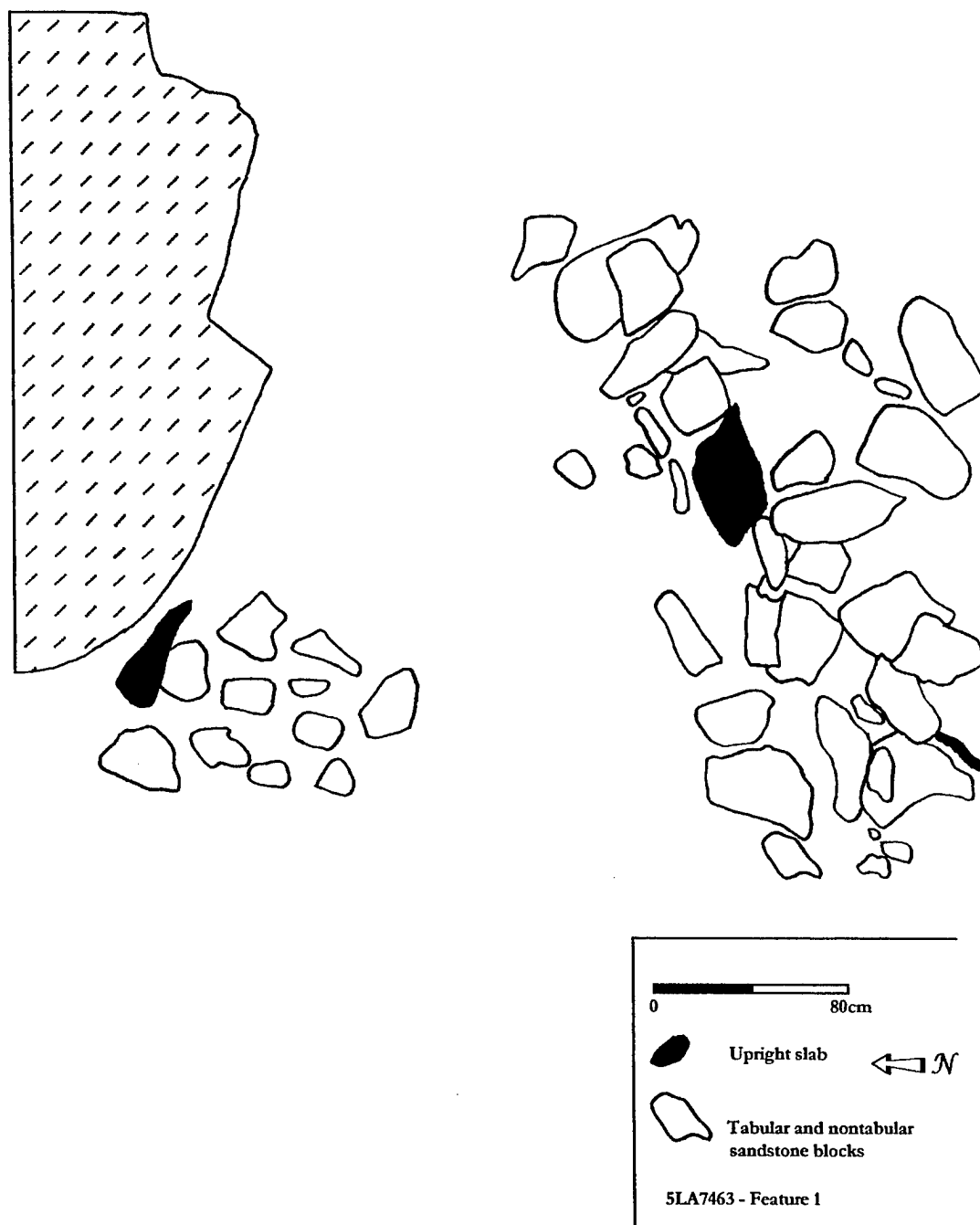


Figure 3.121: Planview of Feature 1, 5LA7463.

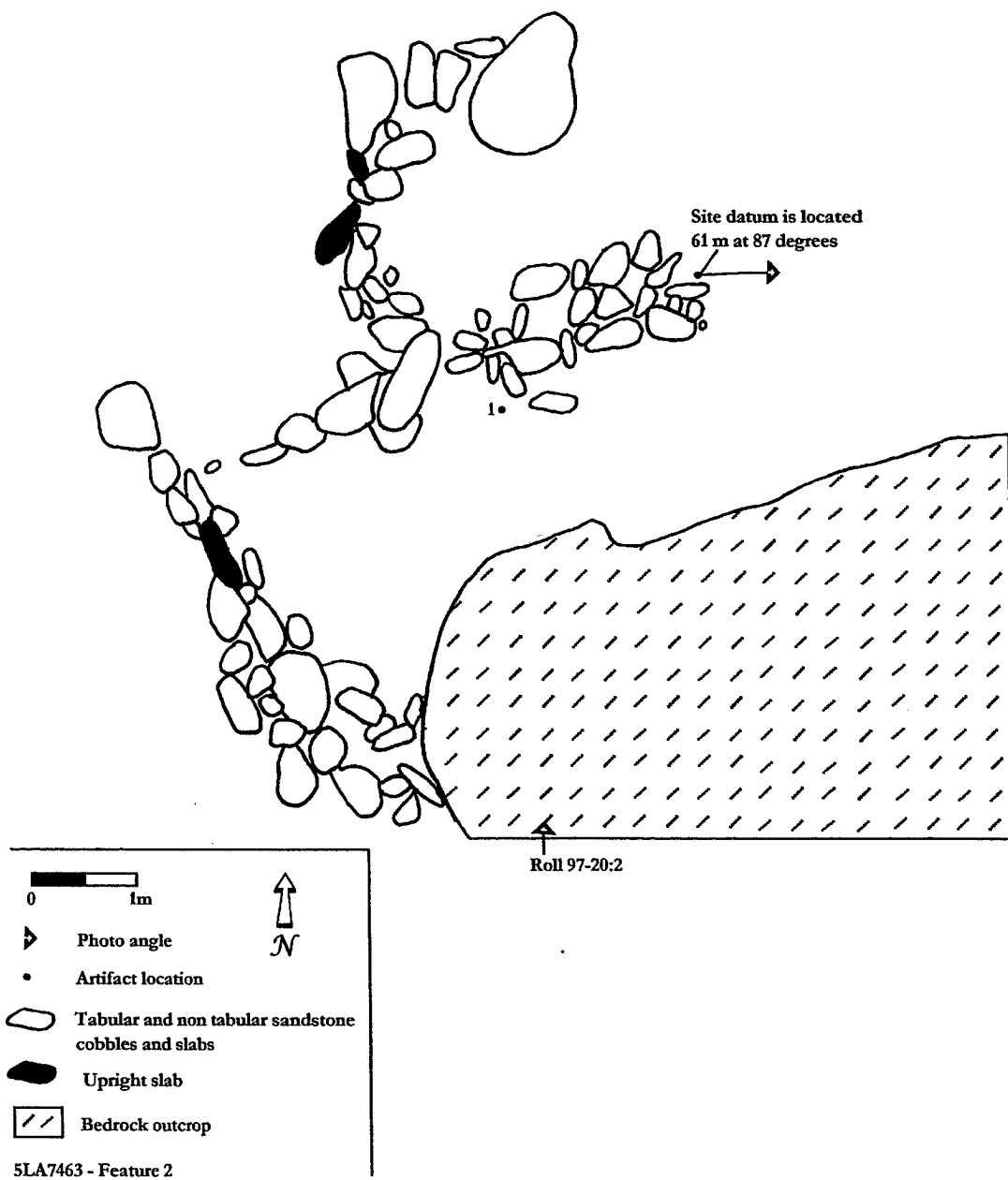


Figure 3.122: Planview of Feature 2, 5LA7463.

Both of these structures are within 12 m of the cliff edge and because of this criterion, they are typed as Class I, cliff edge placement units (Kalasz 1989:96). According to Campbell (1969:338, 389, 392), these structures are defensive in character and they date to approximately A.D. 1000 to A.D. 1400. These dates, if accurate, would mean that the site likely had an occupation that falls within the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

A total of 142 pieces of chipped-stone debitage were recorded (Table 3.29). Of the debitage, 78% is quartzite, 15% is chert, 4% is hornfels/basalt, 2% is argillite, and there is one flake of silicified wood. Of the quartzite debitage, 75% is the large size grade, 25% is small; 57% of the debitage is noncortical, 43% has cortex; 16% is recorded as complex flakes, 7% as shatter, 76% as simple flakes, and one is recorded as a bifacial-thinning flake. Of the chert debitage, 29% is the large size grade, and 71% is small; 81% of the debitage is noncortical and 19% has cortex; 52% is recorded as complex flakes, 10% as shatter, and 38% as simple flakes.

Figure 3.123 shows a scatter plot of the quartzite and chert debitage. According to this, freehand percussion generated both the quartzite and chert debitage. The plot for quartzite is slightly lower in percentage of small, cortical flakes than the average for all quartzite flakes recorded in the survey. This pattern suggests that early-stage reduction strategies were employed at the site. A quartzite bifacial-thinning flake indicates at least one biface was manufactured on site. According to the plot, the later stages of chert lithic reduction were also carried out. This inference is supported by the relatively high percentage of complex flakes (52%). It is important to note that the sample size of small chert flakes (15) is relatively low and may be skewing the results. The counts for the remaining material types were too low for meaningful analysis.

Unfortunately, no temporally diagnostic materials, such as projectile points or ceramics, were recovered from the site. Little can be said regarding how the site fits into the regional chronology.

The flaked tool assemblage consists of three artifacts. Of these, two are end/side scrapers and one is a biface. The reduction stages for the end/side scrapers are one finished and one nearly finished specimen. Of these, the coarse-grained quartzite specimen is complete and displays retouch modification and light use wear along both lateral edges and the distal end. The chert specimen is broken and exhibits heavy use wear and retouch modification along the left lateral edge and the distal end. The unfinished biface specimen is complete and made of fine-grained quartzite. Because of the early manufacturing stage, no use wear is noted.

Two bedrock metates were recorded at the site. One of these is located approximately 143 degrees and 45 m from the site datum. Four ground surfaces and an area of pecking were noted on the outcropping of sandstone bedrock. The other bedrock metate is located 260 degrees and 55 m from the site datum. Only one ground surface was noted on the outcropping of sandstone bedrock. The bedrock and ground surface are both badly eroded. In addition to the bedrock metates, 16 other pieces of ground stone were recorded at the site. Eleven of these were manos, four were metates, and one was an edge-ground cobble.

Table 3.29: Summary Description of Chipped-Stone Debitage for 5LA7463.

	Argillite	Chert	Hornfels/Basalt	Quartzite	Silicified Wood
Total flakes	3	21	6	111	1
Large	0	6	3	83	0
Small	3	15	3	28	1
Noncortical	1	17	4	63	1
Cortical	2	4	2	48	0
Bifacial-thinning	0	0	0	1	0
Bipolar	0	0	0	0	0
Complex	0	11	1	18	0
Shatter	0	2	0	8	0
Simple	3	8	5	84	1

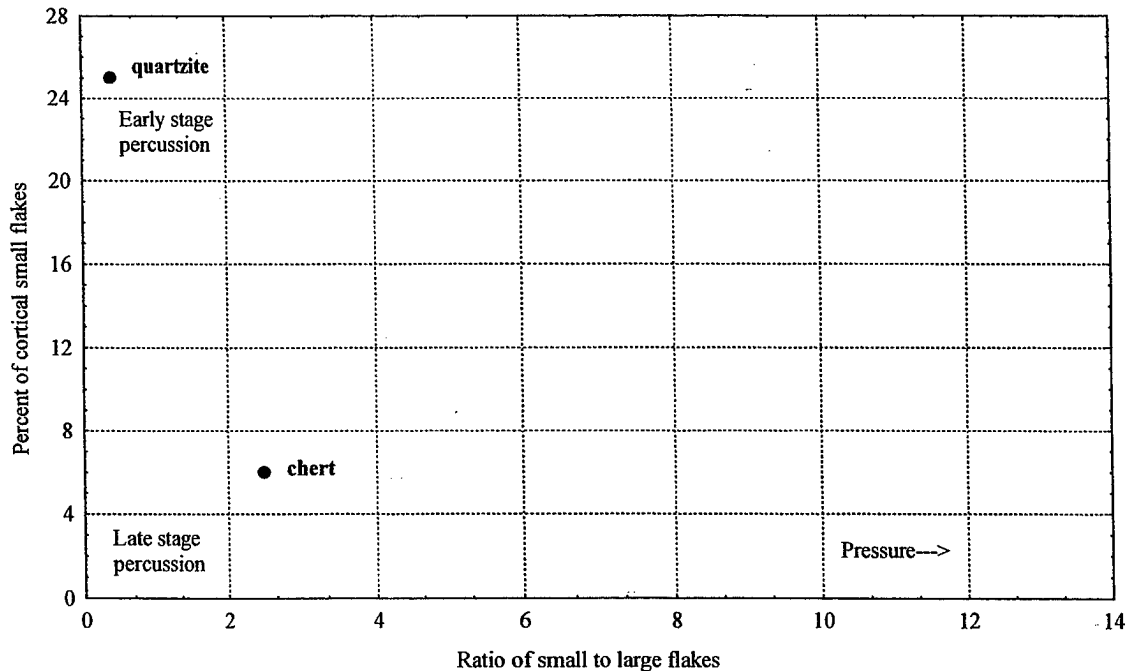


Figure 3.123: Plot of the debitage from 5LA7463.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7463 is a structure site with a high artifact density. The presence of a great deal of ground stone indicates that plant processing was an important activity carried out at the site and that there is a good potential for recovering macrobotanical and/or pollen material from test excavations. We suggest that the site be revisited for more detailed mapping and additional surface collection. Areas where there is a potential for intact, buried deposits (especially in the eastern part of the site and around Features 1 and 2) should be noted and tested.

5LA7466

The site is a lithic scatter and habitation site located on the east side of a large north-south trending ridge that forms the major part of the northern side of Welsh Canyon. The 1.36-acre site (Figures 3.124 and 3.126) is situated in an area that slopes toward the canyon edge to the east. An eroded arroyo is located in the southeast corner of the site. The site datum is at approximately 1,526 m (5,005 ft) asl. Elevations range from approximately 1,529 m (5,015 ft) in the west to 1,489 m (4,885 ft) in the drainage bottom.

Juniper scrub dominates the area surrounding the site. Juniper, *Rhus trilobata*, mountain mahogany, yucca, prickly pear, and grama grass were growing on the site when it was recorded. Soils range between 0 and 35 cm. Exposed bedrock is present, especially in the area of the drainage. Other areas, in the western part of the site, have more soil deposition.

One isolated structure (Figure 3.125) was recorded at the site (Feature 1). It is located on the edge of the drainage in the southeast corner of the site at approximately 37 m and 130 degrees from the site datum. The structure is circular, composed of sandstone slabs, and measures 3.5 x 3 m. Three of the sandstone slabs appear to be in an upright position. This structure is within 12 m of the cliff edge and because of this criterion, it is typed as a Class I, cliff edge placement unit (Kalasz 1989:96). According to Campbell (1969:338, 389, 392), these structures are defensive in character and they date to approximately A.D. 1000 to A.D. 1400. These dates, if accurate, would mean that the site had an occupation that falls within the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

Another feature comprised of an area of thermally altered rocks and ash (Feature 2) is located at approximately 15 m and 90 degrees from the site datum. The feature measures 4 x 2 m and is thought to have at least 35 cm of deposition.

A total of 161 pieces of chipped-stone debitage were recorded from the site (Table 3.30). Of the total debitage, 78% is quartzite, 14% is chert, 6% is argillite, 2% is hornfels/basalt, and there was one flake of silicified wood. Of the quartzite debitage, 67% sorted into the large size grade, while 33% is small; 51% of the debitage is noncortical and 49% has cortex; and 20% is recorded as complex flakes, 3% as shatter, and 79% as simple flakes. Of the chert debitage, 18% falls into the large size grade, while 82% is recorded as small; 86% of the debitage is noncortical and 14% has cortex; and 18% is recorded as complex flakes, 14% as shatter, and 68% as simple flakes.

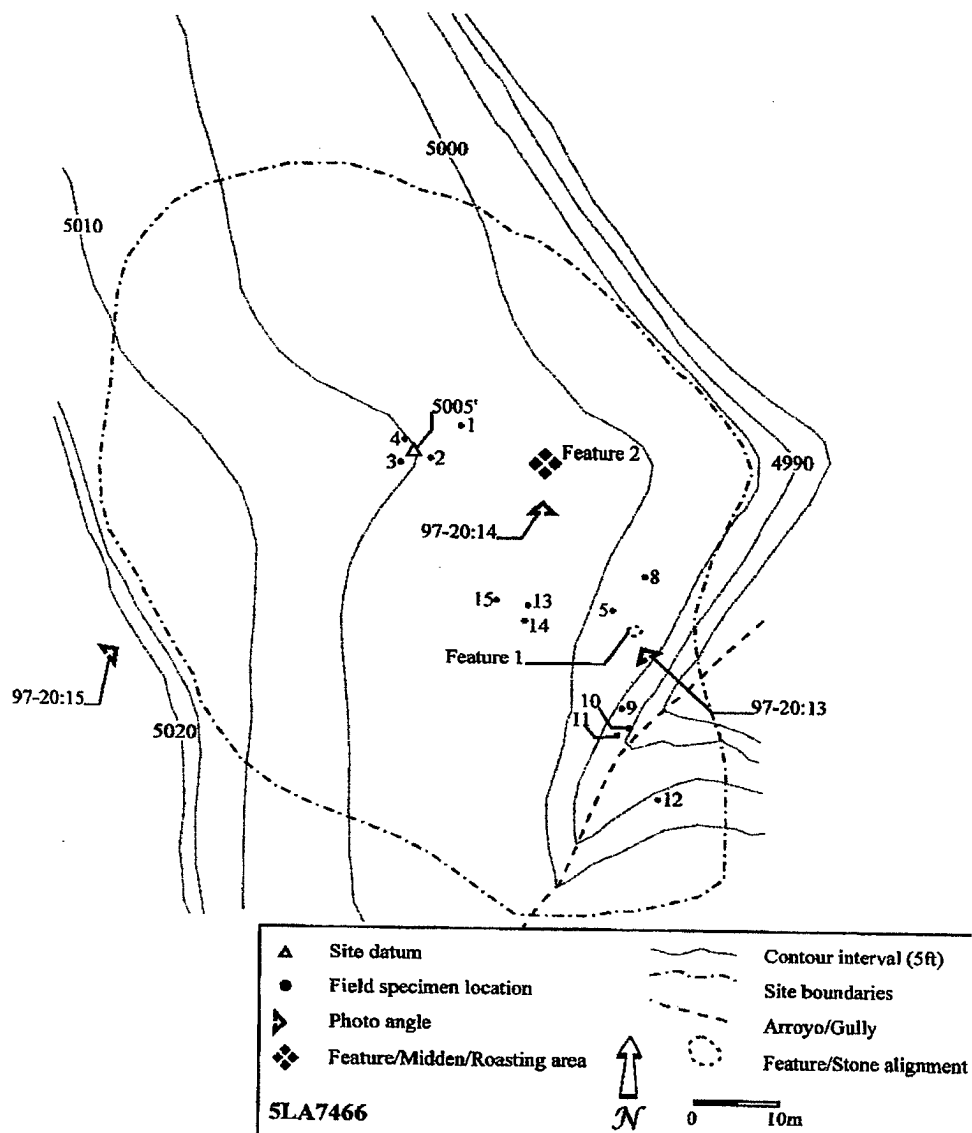


Figure 3.124: Site map, 5LA7466.

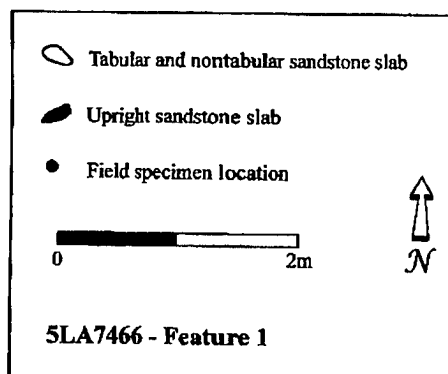
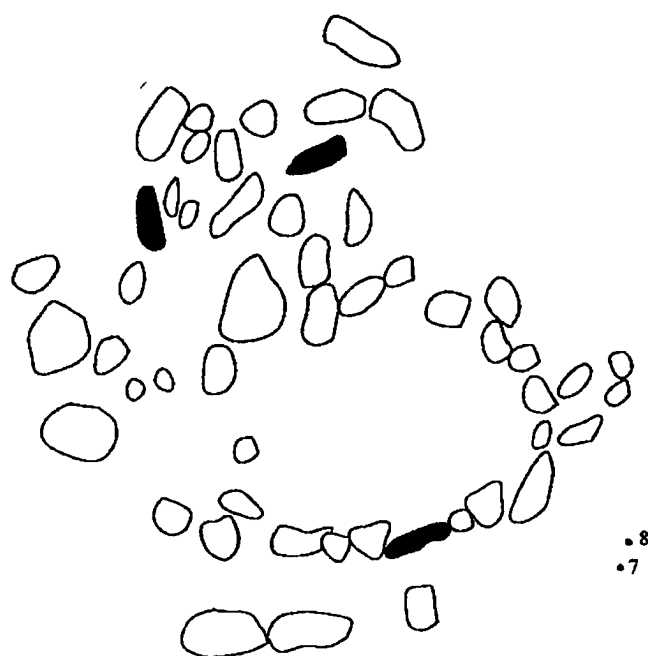


Figure 3.125: Planview of Feature 1, 5LA7466.

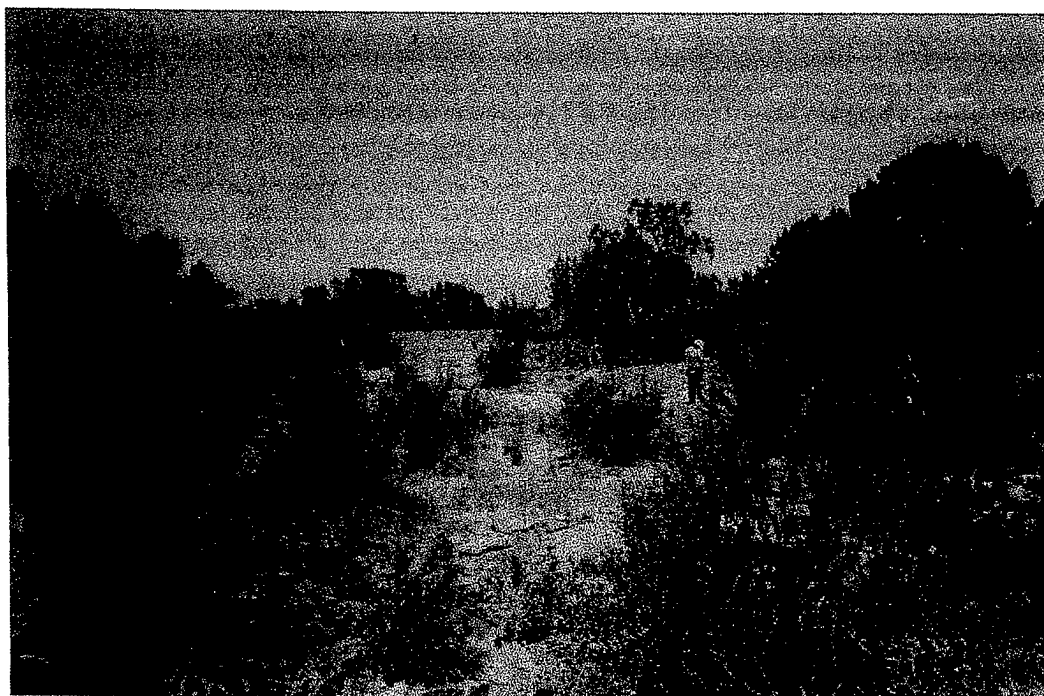


Figure 3.126: View of Site 5LA7466 from southeast boundary facing 330°.

Freehand percussion was likely the most important technique in generating the quartzite debitage (Figure 3.127). The small to large flake ratio (4.5:1) for the chert debitage indicates that pressure flaking as well as free hand percussion of that material type was carried out. The plot for quartzite is lower in terms of the percent of small, cortical flakes than the average for all the quartzite flakes recorded in the survey. This pattern suggests that later stage lithic reduction of quartzite helped to generate the debitage. The chert debitage also plots out slightly lower in terms of small, cortical flakes than the average of all sites recorded in the survey. Given the ratio of small to large flakes, it can be inferred that late-stage lithic reduction of chert occurred at the site. However, the sample size of small chert flakes (18) is relatively low and may be skewing the results. The counts for the remaining material types were too low for meaningful analysis.

Only one temporally diagnostic projectile point (5LA7466.0.2) was found on the surface of the site. This specimen most closely resembles Anderson's (1989) P62 type, which has associated dates that range between A.D. 500 and A.D. 1400.

The tool assemblage consists of three unfinished bifaces, one finished uniface tool, and one non-bipolar core. All of the bifaces are made of coarse-grained quartzite, and two of the three are broken. Visible use wear is not detected on any of the specimens. The uniface tool is fine-grained quartzite with retouch modification and light scraper usage seen on the left lateral edge. The core is coarse-grained quartzite.

Table 3.30: Summary Description of Chipped-Stone Debitage for 5LA7466.

	Argillite	Chert	Hornfels/Basalt	Quartzite	Silicified Wood
Total flakes	9	22	3	126	1
Large	8	4	3	85	1
Small	1	18	0	41	0
Noncortical	4	19	2	64	0
Cortical	5	3	1	62	1
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0
Complex	5	4	1	25	0
Shatter	0	3	0	4	0
Simple	4	15	2	97	1

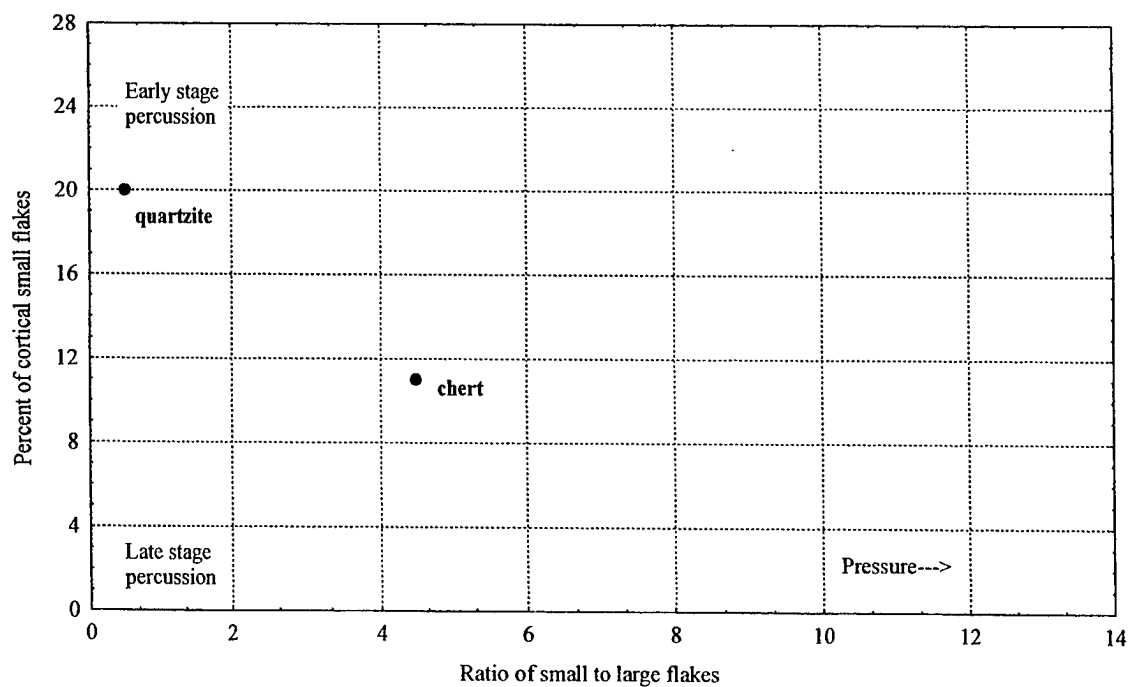


Figure 3.127: Plot of the chert and quartzite debitage from 5LA7466.

Nine pieces of ground stone were recorded at the site. Of these, six are manos, two are edge-ground cobbles, and one is a slab metate. While some of the ground stone is found near the site datum (FS 2 and 3), much of it seems to cluster around the drainage located in the southeast corner of the site (FS 5, 11, 12, 13, and 14).

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7466 is a structure site with a high artifact density. The site exhibits some deposition, especially around Feature 2. Diagnostic artifacts were recovered from the surface, and it is likely that more are present in subsurface contexts. Since Feature 2 appears to be a hearth or roasting pit, there is a good probability that charcoal may be recovered for radiocarbon dating. The presence of a great deal of ground stone indicates that plant processing was an important activity carried out at the site and that there is a good potential for recovering macrobotanical and/or pollen material from test excavations. We suggest that the site be revisited for more detailed mapping and additional surface collection. Areas where there is a potential for intact buried deposits (especially around Features 1 and 2) should be noted and test excavated to determine whether such deposits are present.

5LA7471

The site is a large lithic scatter located on the crest of the ridge that makes up the Black Hills (Figure 3.128). It is situated approximately 250 m south southeast of Sugarloaf Springs. A small, unnamed drainage forms the eastern boundary of the 3.4-acre site, and the two-track road that spans the Black Hills is located just off the northern limits. The site datum is at an elevation of approximately 1,593 m (5,225 ft) asl, and there is little topographic relief within the boundaries of the site.

Vegetation is mainly juniper, prickly pear, cholla, grama and bunch grass, and yucca. The site is situated on a gentle slope with little soil deposition. For the most part, deposition is less than 10 cm, with some areas of exposed bedrock.

The site includes a possible hearth (Feature 1) situated within a lithic concentration. It consists of fire-cracked rock and ash and measures approximately 140 cm by 125 cm. This feature is located approximately 75 m and 210 degrees from the site datum.

A total of 161 pieces of chipped-stone debitage were recorded from the site (Table 3.31). Of the total debitage, 64% is quartzite, 31% is chert, 3% is chalcedony, 2% is hornfels/basalt, and one flake of argillite. Of the quartzite debitage, 84% is classified as the large size grade, while 16% is small; 51% of the debitage is noncortical and 49% has cortex; and 31% is recorded as complex flakes, 7% as shatter, and 62% as simple flakes. Of the chert debitage, 16% falls into the large size grade, while 84% is recorded as small; 90% of the debitage is noncortical and 10% has cortex; and 12% is recorded as complex flakes, 2% as shatter, and 86% as simple flakes.

Figure 3.129 shows a scatter plot of the quartzite and chert debitage. A rather high small to large flake ratio (5.25:1) for the chert indicates that some later stage biface manufacturing

occurred on site. The plot for quartzite comes out much higher in terms of the percent of small, cortical flakes than the average for all the quartzite flakes recorded in our survey. This pattern shows that early-stage lithic reduction generated the quartzite debitage. Though the sample size for small quartzite flakes is low (16) and may be skewing the results, the high number of large quartzite flakes (87) and cortical quartzite flakes (50) support early-stage raw material reduction. The counts for the remaining material types were too low for meaningful analysis.

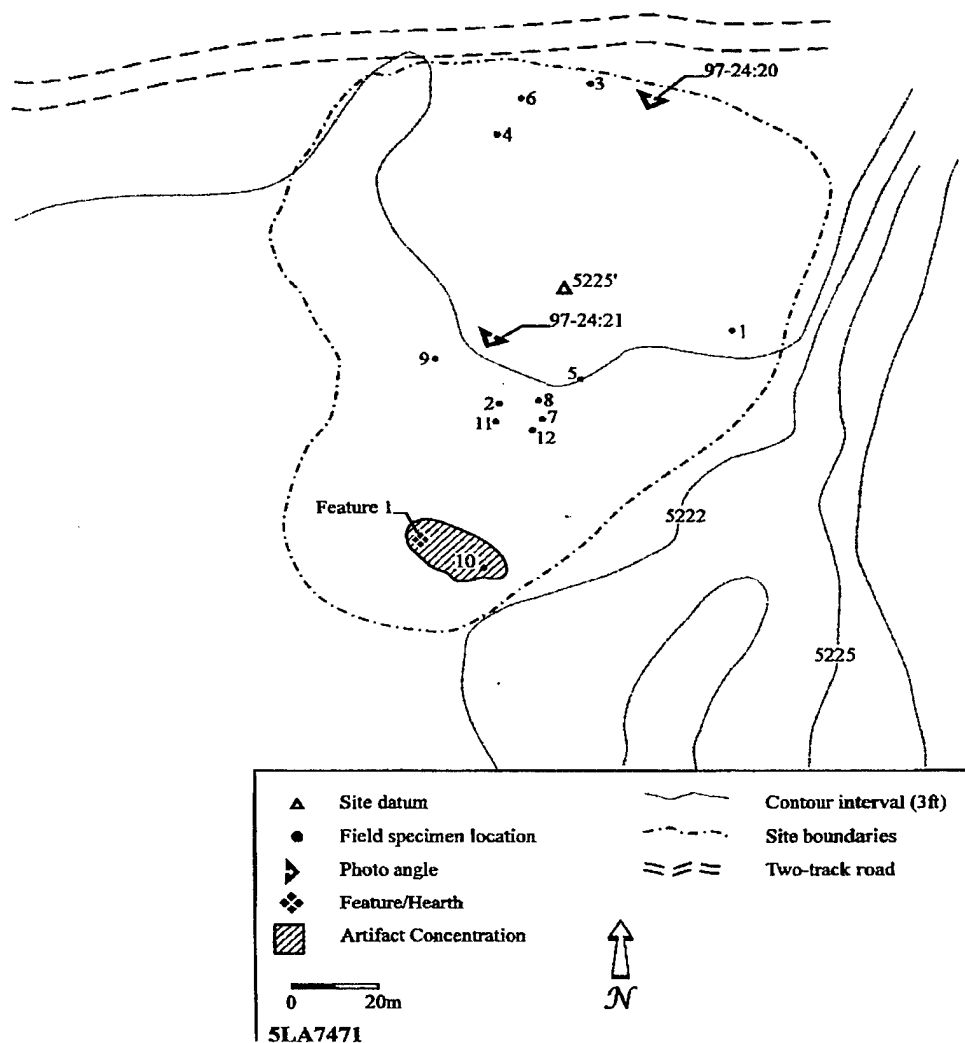


Figure 3.128: Site map, 5LA7471.

Table 3.31: Summary Description of Chipped-Stone Debitage for 5LA7471.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Quartzite
Total flakes	1	4	50	3	103
Large	1	1	8	3	87
Small	0	3	42	0	16
Noncortical	0	4	45	1	53
Cortical	1	0	5	2	50
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0
Complex	1	3	6	1	32
Shatter	0	0	1	0	7
Simple	0	1	43	2	64

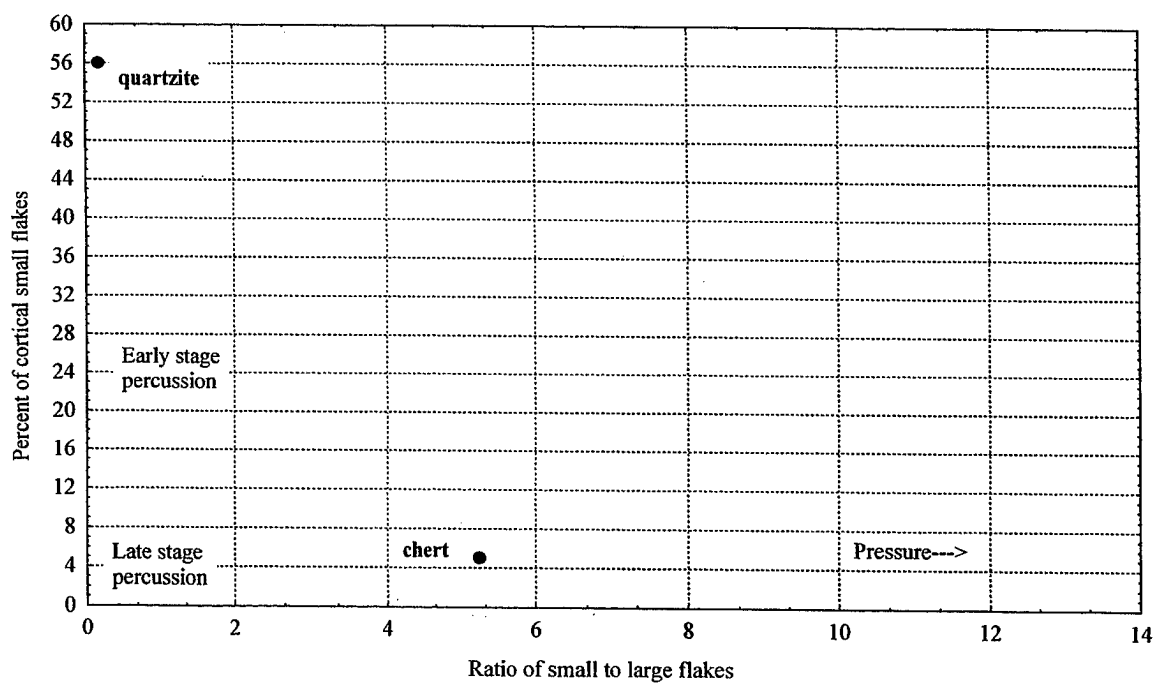


Figure 3.129: Plot of the chert and quartzite debitage from 5LA7471.

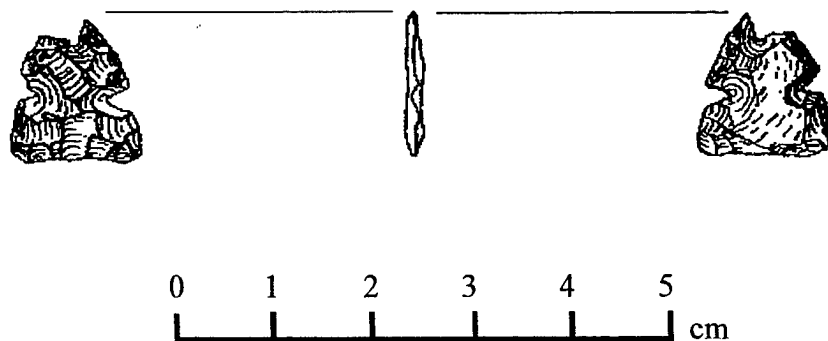


Figure 3.130: Projectile point (5LA7471.0.4) from the surface of 5LA7471.

Two diagnostic projectile points were recorded (Figure 3.130). The first point (5LA7471.0.2) is similar to Anderson's (1989) type P58. This type is associated with dates that range between A.D. 600 and A.D. 1200. The second projectile point (5LA7471.0.4) is a P79 and ranges in time between A.D. 1000 and A.D. 1750. Based on these two artifacts, the site had an occupation during the Early Ceramic Stage (A.D. 200 to A.D. 800/1000).

The tool assemblage consists of two non-bipolar cores, two bifaces, one side scraper fragment, one utilized flake, and one bifacial core-tool. Material types for the cores are chert and coarse-grained quartzite. The core-tool specimen is chalcedony. Both bifaces are quartzite, with no visible use wear noted. The fine-grained specimen is complete and classified as nearly finished. The coarse-grained specimen is broken and classified as unfinished. The side scraper is dendritic chert and exhibits retouch modification and moderate to heavy use wear on both lateral edges. The utilized flake functioned as an expedient scraper and is made of chert. Both lateral edges display light to moderate usage on the margin.

We recommend that the site be nominated to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7471 is a large lithic scatter with a high artifact density. The site exhibits rather shallow soil deposition; however, there were surface indications of thermal features. The presence of diagnostic artifacts is pertinent for addressing issues dealing with chronology. The presence of a possible hearth also indicates a good chance of locating pollen, faunal, and macrobotanical remains useful for reconstructing subsistence. Although the site is recognized as having the potential to yield information, it needs to be revisited for more detailed mapping. Subsurface testing to determine the presence of intact buried deposits (around Feature 1) is also recommended.

5LA7491

This site is a lithic scatter with rockshelters on a large north-south trending ridge that forms a major part of the northern side of Welsh Canyon. The site faces east, overlooking a deep north-south tributary canyon. This approximately 1.5-acre site extends from the canyon rim up-slope to where the rockshelters are found on the western limits (Figures 3.131 and 3.132). The

site datum is at an elevation of approximately 1,526 m (5,008 ft). The rockshelters rise above the eastern portion of the site by an additional 5 m.

Four rockshelters were recorded at the site (Features 1-4). A minor drainage cuts through a rock ledge where the rockshelters are located, and a dense scatter of artifacts was found where the drainage erodes out onto the terrace. The rockshelters contained no walls or other features and are perhaps better classified as rock overhangs since they are built into large boulders off a bedrock ledge rather than set into an eroded niche off the canyon edge.

Feature 1 is the southernmost shelter, located approximately 58 m and 220 degrees from the datum (Figure 3.133). It measures about 7.2 x 2.9 m and has a floor to ceiling measurement at its highest point of 70 cm. The shelter faces northeast, and a small bedrock boulder sits out in front of its opening. This shelter contains about 10 cm of soil deposition, and artifacts appear to be eroding out, suggesting that it was used for habitation.

Feature 2 is located approximately 43 m and 230 degrees from the datum (Figure 3.133). The opening of the rockshelter is situated in front of a large sandstone boulder and faces to the southwest. The shelter measures approximately 6 x 3.3 m and has a floor-to-ceiling height of 83.5 cm (measured from a centrally located point on the shelter floor). The floor of the shelter is well protected, and soil deposits may exceed 30 cm. This shelter has good potential for intact buried cultural deposits.

Feature 3 is located approximately 45 m and 245 degrees from the datum (Figure 3.134). The opening of the rockshelter is situated in front of a low sandstone ledge, and it faces to the northeast. The shelter measures approximately 9.3 x 2.4 m and has a floor-to-ceiling height of 91.5 cm (measured from a centrally located point on the shelter floor). The floor of this shelter is badly eroded, and some areas exhibit exposed bedrock.

Feature 4 is the northernmost of the rockshelters and is located approximately 39 m and 260 degrees from the datum (Figure 3.134). The opening of the rockshelter is situated in front of a low sandstone ledge, and it faces to the northeast. The shelter measures approximately 7.5 x 2.1 m and has a maximum floor-to-ceiling height of 1.65 m. The floor of this shelter is badly eroded, and some areas exhibit exposed bedrock.

A total of 147 pieces of chipped stone were recorded from the site (Table 3.32). Of the total debitage, 96% is quartzite, 3% is chert, and there is one flake each of chalcedony and quartz. Of the quartzite debitage, 72% is classified as the large size grade, while 28% is small; 30% of the debitage is noncortical and 70% has cortex; and 11% is recorded as complex flakes, 5% as shatter, and 84% as simple flakes.

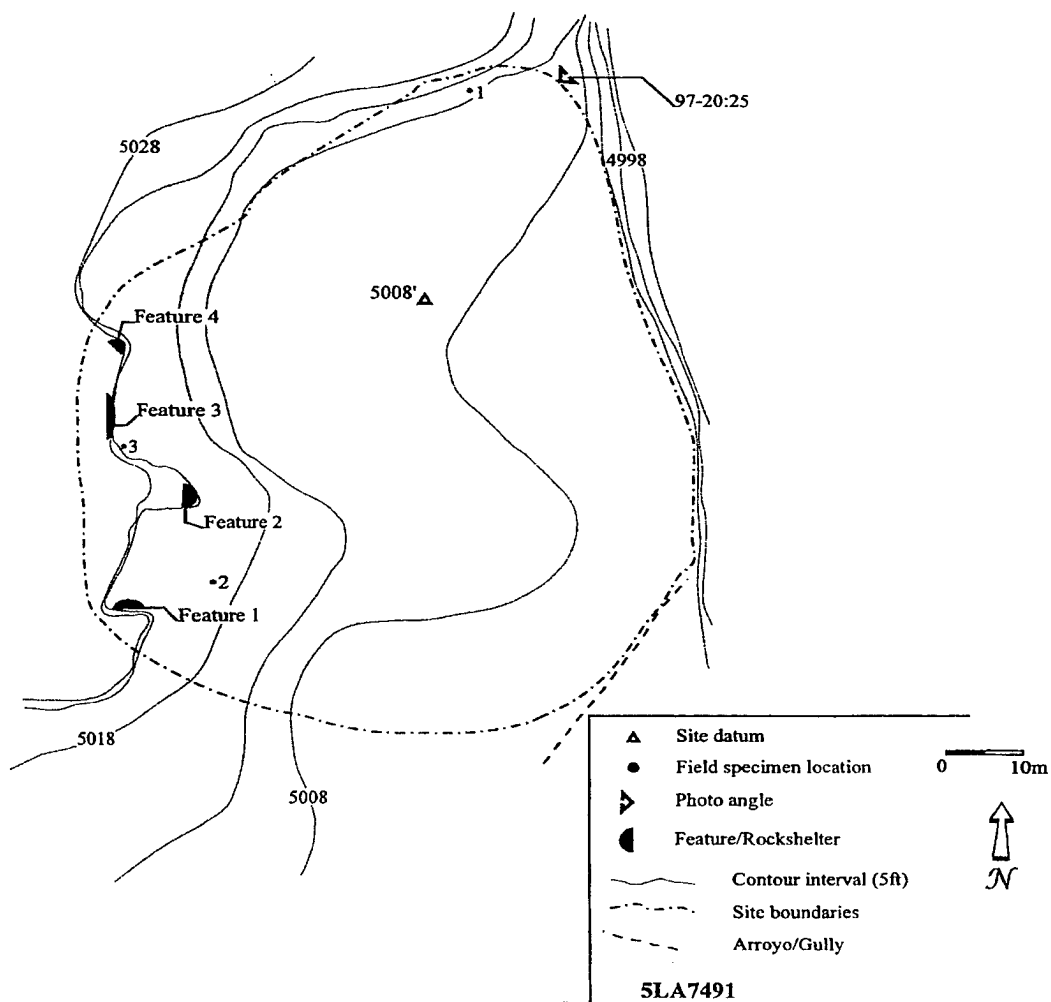


Figure 3.131: Site map, 5LA7491.

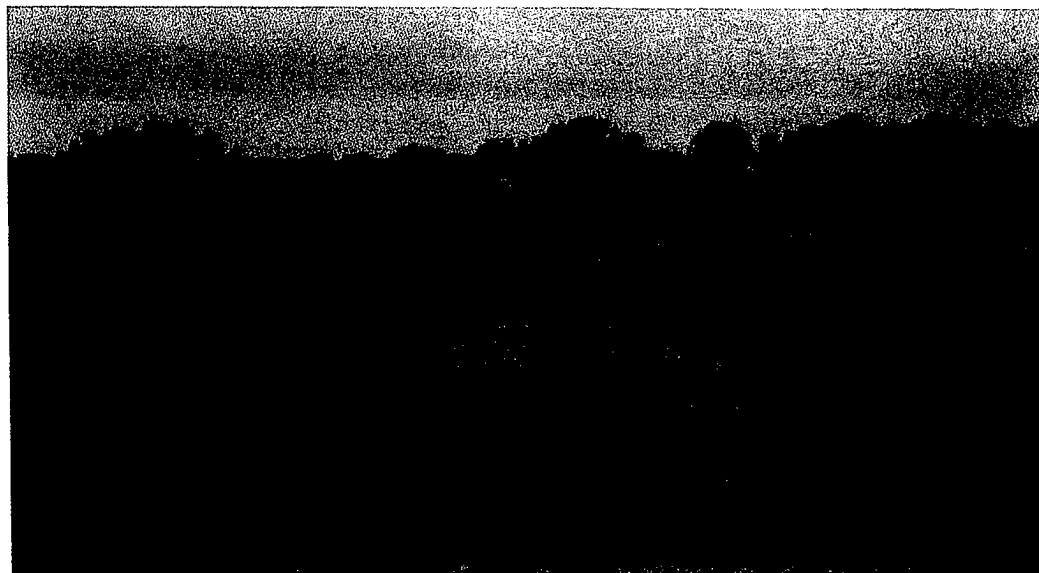


Figure 3.132: Overview of Site 5LA7491 from canyon rim facing 230°.

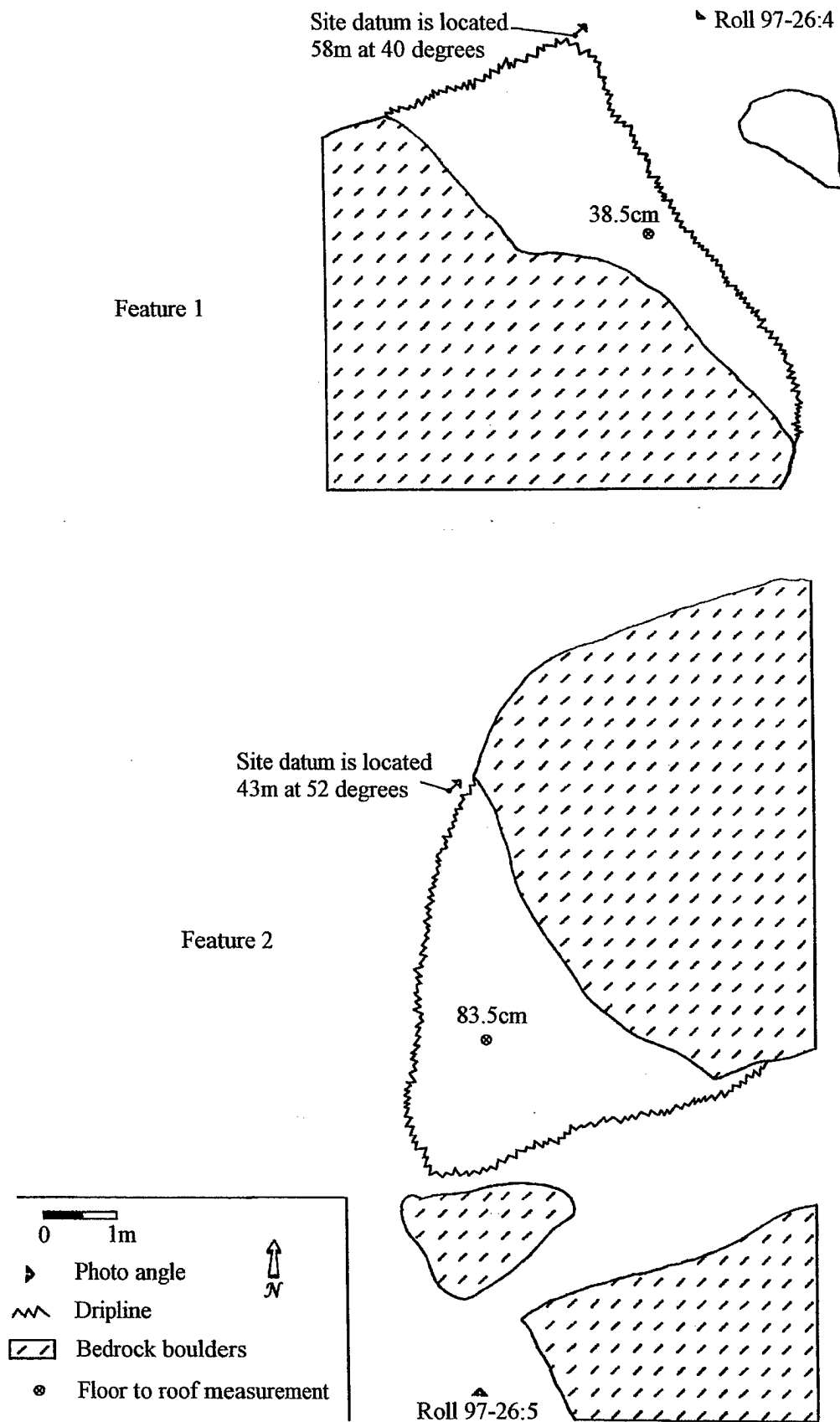


Figure 3.133: Planview maps of Features 1 and 2, 5LA7491.

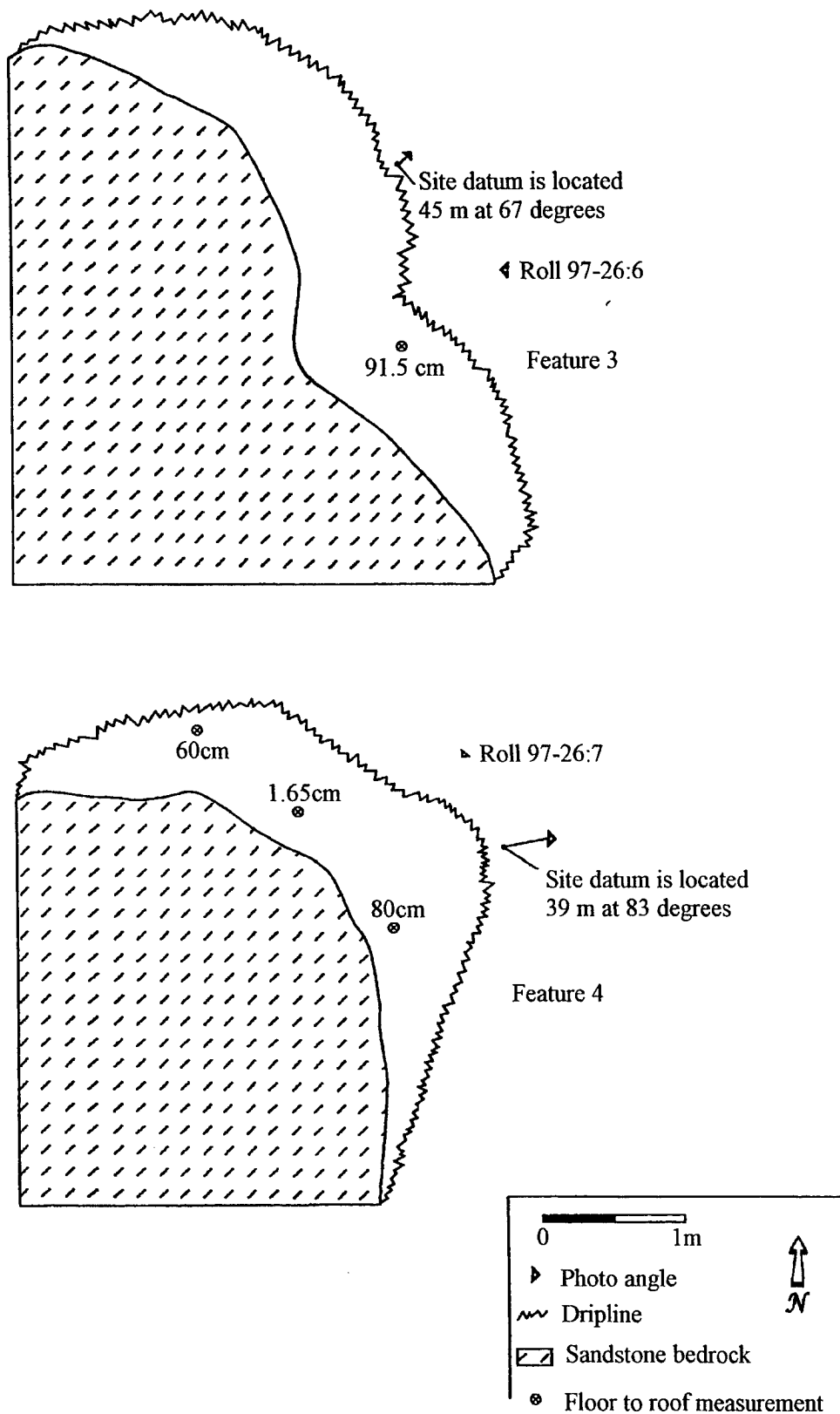


Figure 3.134: Planview maps of Features 3 and 4, 5LA7491.

Table 3.32: Summary Description of Chipped-Stone Debitage for 5LA7491.

	Chalcedony	Chert	Quartz	Quartzite
Total flakes	1	4	1	141
Large	0	2	1	102
Small	1	2	0	39
Noncortical	0	3	0	42
Cortical	1	1	1	99
Bifacial-thinning	0	0	0	0
Bipolar	0	0	0	0
Complex	1	3	0	15
Shatter	0	1	1	7
Simple	0	0	0	119

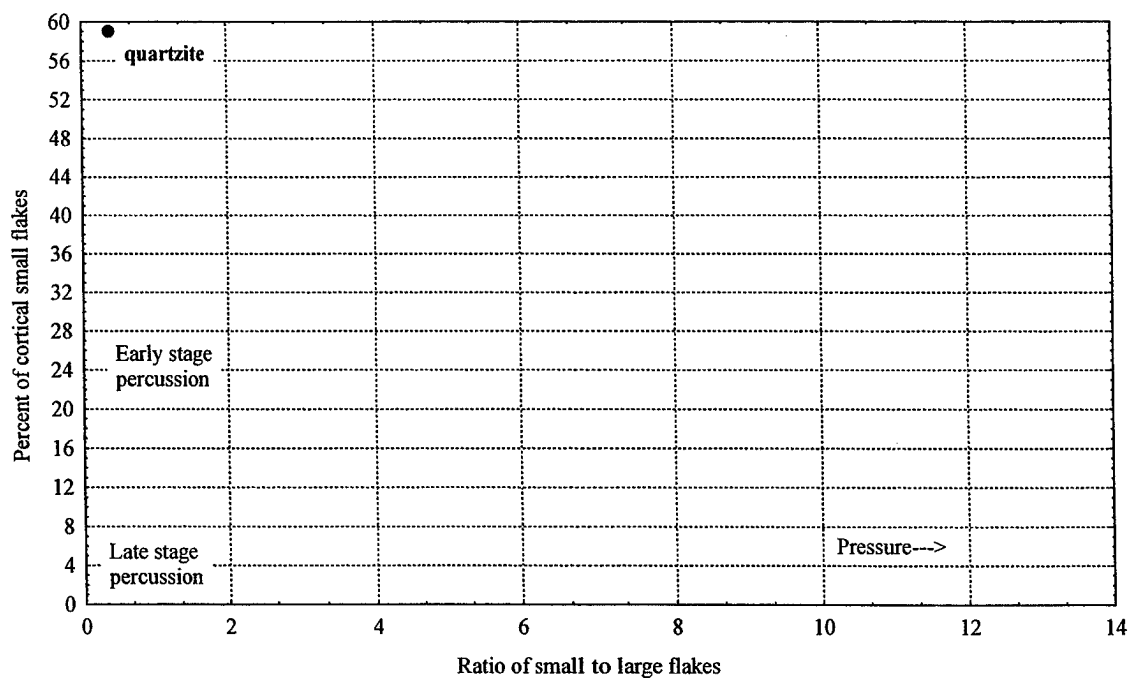


Figure 3.135: Plot of the quartzite debitage from 5LA7491.

Freehand percussion was the most prevalent technique in generating the quartzite debitage (Figure 3.135). The plot for quartzite comes out much higher in terms of the percent of small, cortical flakes than the average for all the quartzite flakes recorded in the survey. This pattern suggests that early-stage lithic reduction of quartzite generated the debitage. The counts for the remaining material types were too low for meaningful analysis.

No temporally diagnostic materials, such as projectile points or ceramics, were recorded from the site. Little can be said of how the site fits into the regional chronology. The tool assemblage consists of one coarse-grained quartzite core-tool that was analyzed in the field and not collected.

Site 5LA7491 is a lithic scatter and rockshelter site with a high artifact density. The site exhibits rather shallow soil deposition; however, Feature 2 appears to have soil deposits of up to 30 cm and may contain intact buried cultural deposits. Test excavations in Feature 2 have a good chance for locating data such as pollen, faunal, and macrobotanical remains useful for reconstructing subsistence and paleoenvironment. We suggest that the site be revisited for more detailed mapping and additional surface collection. Areas where there is a potential for uncovering intact subsurface cultural deposits should be tested to determine whether such deposits are present. We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D).

5LA7509

This site consists of a broad scatter of lithics across a shallow, dry arroyo (Figures 3.136 and 3.137). The arroyo partly drains a ridge on the northern side of the Black Hills into Sugarloaf Canyon. The approximately 1.7-acre site slopes down approximately 2 m to the northwest. The site datum is at an elevation of approximately 1,603 m (5,260 ft) asl.

Although lithic density is low overall, at least three moderate- to high-density clusters are present. One of these is associated with a midden consisting of thermally altered rocks and potsherds (Feature 1). This midden, which measures approximately 10 m in diameter, is on the western side of a vertical face in a natural stone outcropping that may have served as a windbreak or shelter.

Cholla, grama, prickly pear, yucca, rabbit bush, and juniper were growing on the site when it was recorded. Soils are relatively thin throughout the site, with deposits of less than 12 cm. However, considerably more deposition may be present, especially around Feature 1. The areas of concentrated surface lithics also may be good locations to search for buried deposits.

A total of 91 pieces of chipped stone were recorded (Table 3.33). Of the total debitage, 77% is quartzite and 23% is chert. Of the quartzite debitage, 80% is classified as the large size grade, while 20% is small; 50% of the debitage is noncortical and 50% has cortex; and 34% is recorded as complex flakes, 3% as shatter, and 63% as simple flakes. Of the chert debitage, 62% is the large size grade, while 38% is small; 43% of the debitage is noncortical and 57% has cortex; and 19% is recorded as complex flakes, 10% as shatter, and 71% as simple flakes.

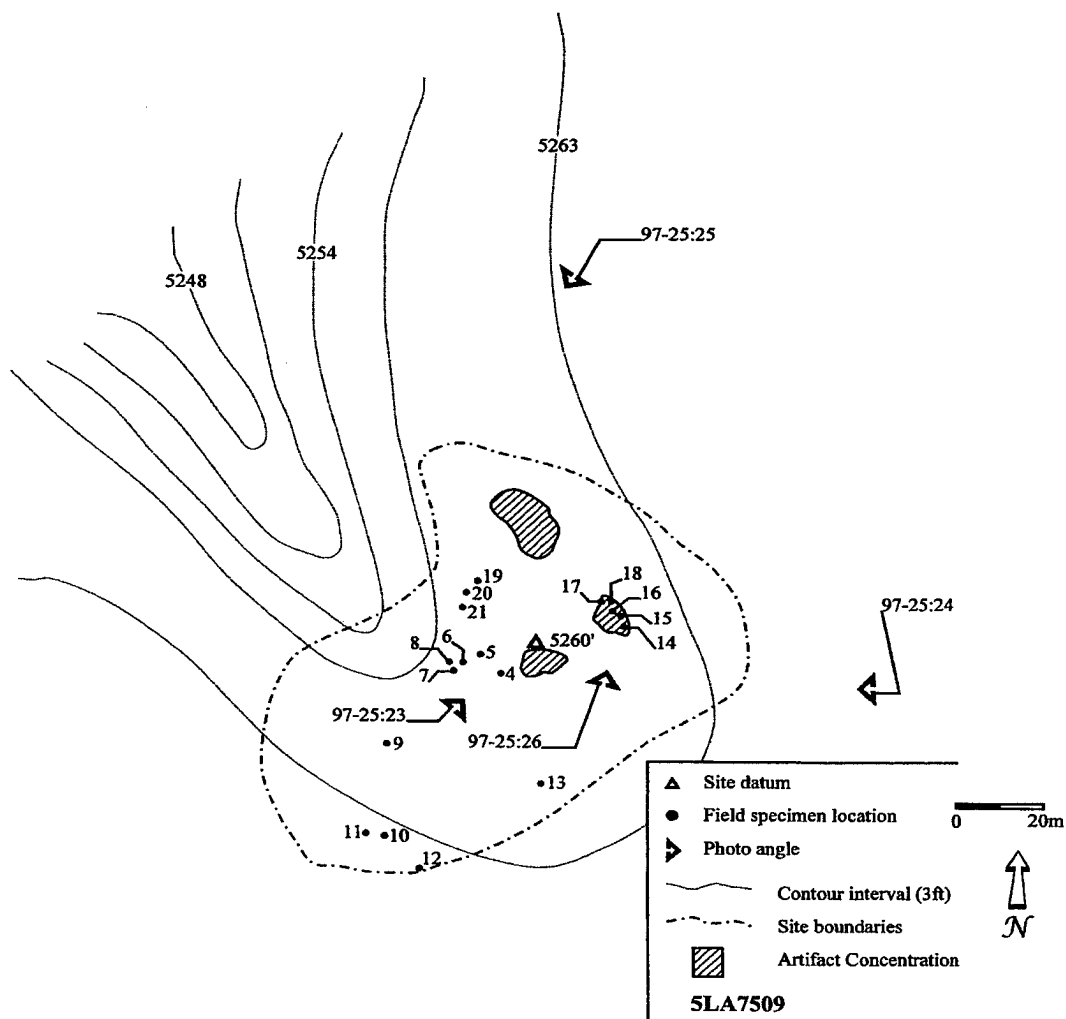


Figure 3.136: Site map, 5LA7509.

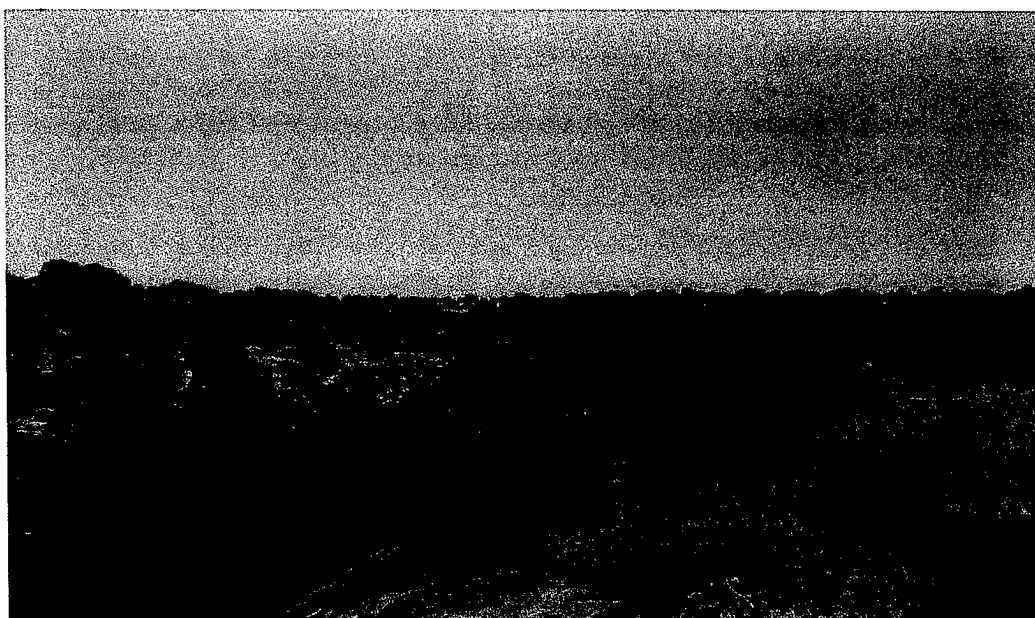


Figure 3.137: Overview of 5LA7509 facing 130°.

Table 3.33: Summary Description of Chipped-Stone Debitage for 5LA7509.

	Chert	Quartzite
Total flakes	21	70
Large	13	56
Small	8	14
Noncortical	9	35
Cortical	12	35
Bifacial-thinning	0	0
Bipolar	0	0
Complex	4	24
Shatter	2	2
Simple	15	44

The frequencies of small flakes are low for both the chert (8) and quartzite (14) debitage and a plot of the two would likely be skewed. The ratios of small to large flakes for both material types are relatively low and suggest that freehand percussion was important in generating the chert and quartzite debitage. A high proportion of cortical flakes and shatter indicates early-stage lithic reduction. The quartzite debitage is somewhat difficult to interpret. Fifty percent of the quartzite flakes have cortex, but only 14% of the small flakes have cortex. This value is considerably lower than the value for all sites recorded in the Black Hills and indicates that the later stages of lithic reduction were responsible for generating the quartzite debitage.

One diagnostic projectile point (5LA7509.0.7) was found on the surface of the site. This specimen most closely resembles Anderson's (1989) P58 type, which has associated dates that range from A.D. 600 to A.D. 1200. Four body sherds were found at the site. These specimens came from the area around the bedrock outcrop to the northeast of the site datum. All the sherds come from the same vessel with crisscross, overlapping, and partly obliterated cord-marks on the exterior surface (Appendix II). These sherds resemble Hummer's (1989) Category 4, which can be cross-dated to similar types from the Middle Woodland Upper Republican (Plains Village period, A.D. 1050-1450) or Middle Woodland Apishapa phase pottery (A.D. 1000-1300). Based on these artifacts, we can infer that the site had at least one occupation some time probably during the Middle Ceramic stages (A.D. 800/1000 to A.D. 1500).

The stone-tool assemblage consists of ten artifacts, of which five are non-bipolar cores, four are bifacial core-tools, and one is an end/side scraper. Three of the core-tools and two of the cores are quartzite. The remaining four specimens are chert. The end/side scraper is chert and complete. This specimen is classified as finished and displays light to heavy use wear and retouch modification on the right lateral edge and the distal end.

Two manos and metates were recorded at the site. The two manos are sandstone, and they exhibit pecking and grinding. The metates are also sandstone, but only one (FS 2) has evidence for pecking and grinding. The ground stone is located in the southwest corner of the site.

Site 5LA7509 is a lithic scatter with a moderate artifact density. The site exhibits rather shallow soil deposition; however, there were surface indications of thermal features. The presence of diagnostic artifacts are pertinent for addressing issues dealing with chronology. The presence of ground stone and a possible hearth also indicate a good chance of locating pollen, faunal, and macrobotanical remains. Subsurface test excavations to determine the presence of intact, buried deposits (perhaps around Feature 1) are recommended. We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D).

5LA7518

This site is located on a ridge top at the head of a large north-to-south trending drainage that empties into Welsh canyon to the south. The lithics are found on the western slopes leading down to the drainage and extend over an area of approximately 0.6 acres (Figures 3.138 and 3.139). The datum was set at an elevation of approximately 1,621 m (5,318 ft) asl. The site's lowest point is located in the drainage bottom at an elevation of 1,615 m (5,300 ft) asl.

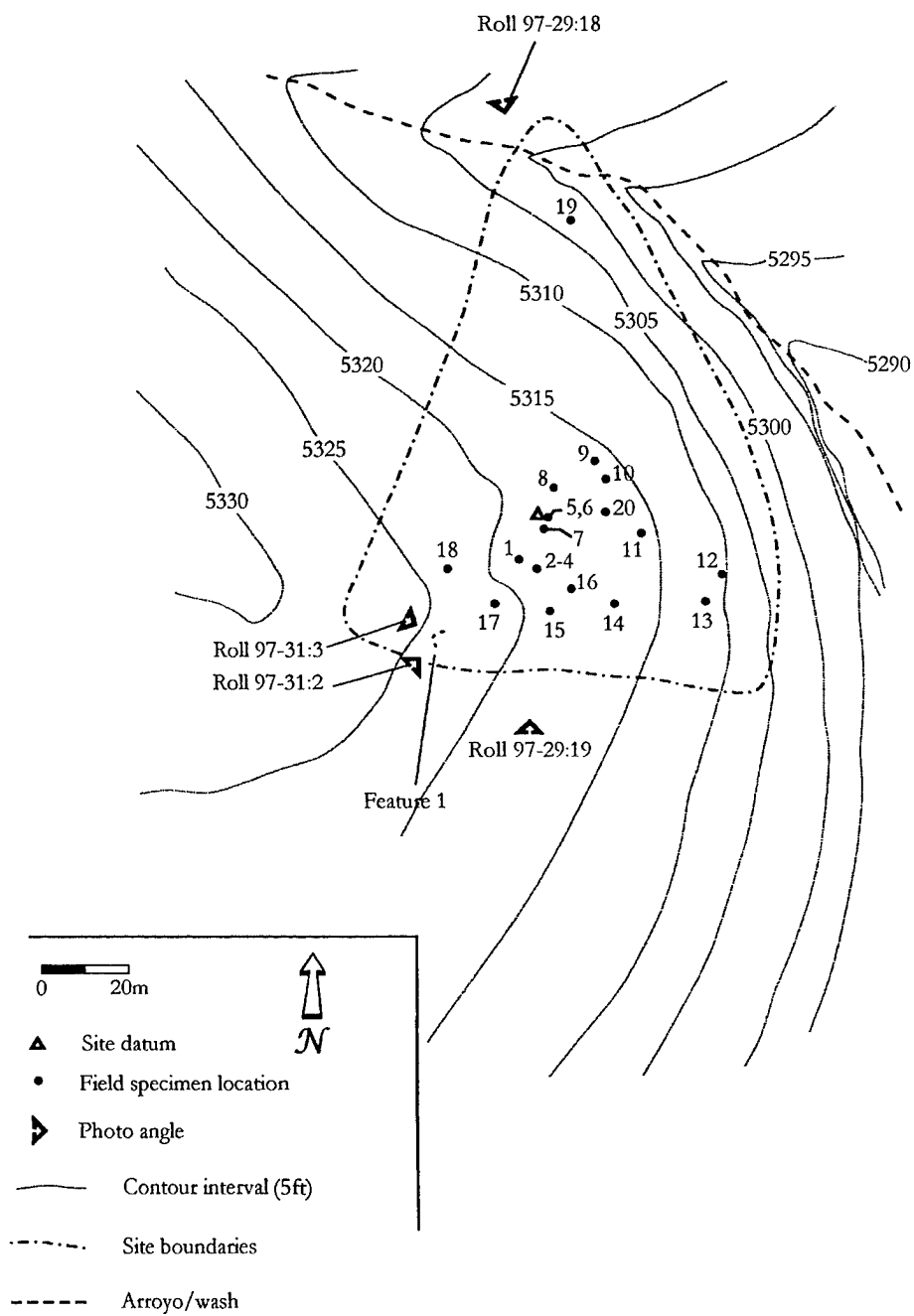
The area surrounding the site is characterized by juniper scrub. Mountain mahogany, piñon, gamble oak, *Rhus trilobata*, prickly pear, and grama grasses were all growing on the site when it was recorded. Soil deposition varies from exposed bedrock to about 25 cm. Erosion is heavy particularly in and near the drainage. Soil deposition increases to around 25 cm north of the site datum at the very head of the drainage.

A single, isolated, semi-circular, structure (Figure 3.140) made of sandstone slabs (one upright) was recorded at the site (Feature 1). It is located approximately 21 m and 220 degrees from the datum. The structure measures about 3.25 x 1.75 m and was likely a fully enclosed unit with less than 50% of the structure remaining. If this was the case, then the structure would be classified as a fully enclosed, isolated, contiguous rock wall unit. According to Kalasz (1989:105), these structures have associated radiocarbon dates that extend from the Early to the Middle Ceramic stage (A.D. 200 to A.D. 1500).

A total of 62 pieces of chipped stone were recorded (Table 3.34). Of the total debitage, 82% is quartzite, 10% is chert, 7% is argillite, and there is one flake of silicified wood. Of the quartzite debitage, 76% falls into the large size grade, while 24% is recorded as small; 57% of the debitage is noncortical and 43% has cortex; 18% is recorded as complex flakes, 2% as shatter, and 80% as simple flakes.

The frequencies of small flakes are low for all materials, and no plot was made. The ratio of small to large flakes for quartzite is relatively low and suggests that freehand percussion was important in generating the quartzite debitage. A high proportion of cortical flakes indicates early-stage lithic reduction activities.

Three diagnostic projectile points (5LA7518.0.3, 5LA7518.0.5, and 5LA7518.0.17) were recorded from the surface of the site. All resemble Anderson's (1989) P49 type, which has associated dates that range between A.D. 800 and A.D. 1750.



5LA7518

Figure 3.138: Site map, 5LA7518.



Figure 3.139: Photograph of Site 5LA7518. Overview from outside the northern boundary at 160°.

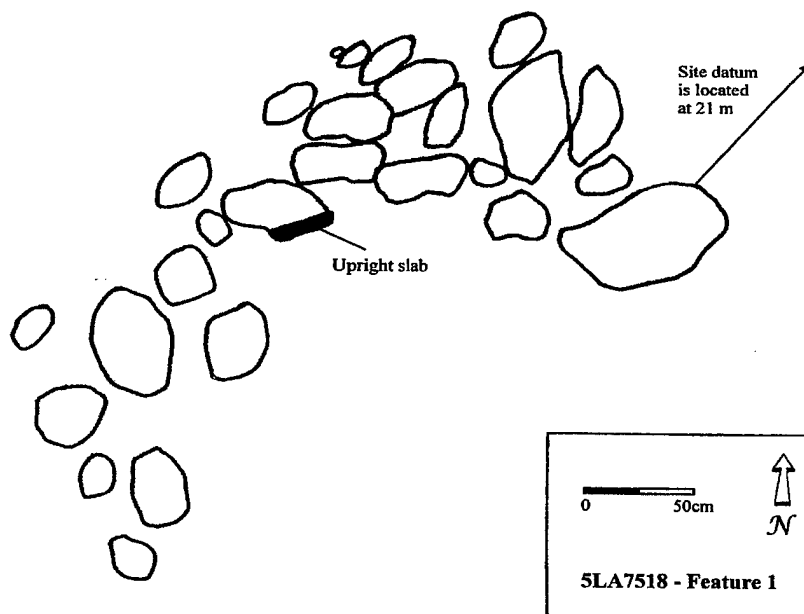


Figure 3.140: Planview of Feature 1, 5LA7518.

Table 3.34: Summary Description of Chipped-Stone Debitage for 5LA7518.

	Argillite	Chert	Quartzite	Silicified Wood
Total flakes	4	6	51	1
Large	4	5	39	1
Small	0	1	12	0
Noncortical	0	5	29	1
Cortical	4	1	22	0
Bifacial-thinning	0	0	0	0
Bipolar	0	0	0	0
Complex	3	1	9	1
Shatter	0	2	1	0
Simple	1	3	41	0

Based on the projectile points and dates associated with the structure, the site was occupied during the Middle Ceramic Stage (A.D. 800/1000 to A.D. 1500), but a slightly more recent occupation during the Late Ceramic Stage (A.D. 1500 to A.D. 1750) cannot be ruled out.

The flaked tool assemblage consists of three unfinished biface fragments. Two of these are coarse-grained quartzite, and one is chert. All display distinct retouch modification with no visible use wear.

Ten manos and three metates were recorded, and all are made of sandstone. All manos except one exhibit evidence of grinding and pecking. Six of the manos recorded were whole, and less than 50% remained of the other four. Two of the metates exhibited evidence of grinding and pecking, while the third one had evidence only for grinding.

We recommend the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7518 is a lithic scatter and structure site. The site exhibits rather shallow soil deposition; however, there were areas of about 25 cm in the northern part of the site. The presence of a structure indicates that the site can yield information about the settlement system of the Black Hills. The presence of diagnostic artifacts is pertinent for addressing chronology. The presence of ground stone and the potential for buried features around the structure indicate a good chance of locating pollen, faunal, and macrobotanical remains useful for reconstructing subsistence. We suggest that the site be revisited for more detailed mapping and additional surface collection. Areas where there is a potential for buried deposits should be tested to determine the presence of subsurface cultural deposits.

5LA7523

The site is a lithic scatter and rockshelter with an enclosing wall. The site is set at the head of a small drainage on the west side of a narrow, north-to-south trending ridge of the Black Hills (Figure 3.141). The ridge extends south into Welsh canyon and the site is located at the narrowest part of the ridge. It extends across the ridge from one side to the other approximately

60 to 65 m. The majority of the site is located south of a terrace. Only a small portion of the site in the north has artifacts that extended up the drainage to the top of the terrace. The site elevation at the datum is 1,619 m (5,310 ft) asl, the top of the terrace in the north is 1,625 m (5,330 ft) asl, and the lowest point of the site is in the south at an elevation of 1,606 m (5,270 ft) asl.

Juniper, cholla, yucca, prickly pear, piñon, grama grasses, and stipa grasses were found growing on this 1.59-acre site. Soil deposition ranges from exposed bedrock, especially in the drainage, to around 25 cm. At least 30-40 cm of deposition is noted in the rockshelter (Feature 1).

The rockshelter (Feature 1) is located 78 m from the datum, and there was only one flake visible on the surface of the shelter floor. There is about 30-40 cm of deposition within the rockshelter. The shelter is not very deep and is actually more of a slight rock overhang, with a semi-circular wall at its mouth enclosing an area that measures 4.2 x 3 m (Figure 3.142). A small gully cuts down into the rock ledge on the northern boundary of the site, and in it we noted several gray chert flakes. These flakes were not recorded as part of the sample of debitage for the site, but they may have eroded out of the rockshelter.

A total of 186 pieces of chipped-stone debitage were recorded from the site (Table 3.35). Of the total debitage, 90% is quartzite, 8% is chert, 1% is hornfels/basalt, and there is one flake each of obsidian and quartz. Of the quartzite debitage, 55% is the large size grade, while 45% is small; 47% of the debitage is noncortical and 53% has cortex; and 19% is recorded as complex flakes, 5% as shatter, and 77% as simple flakes.

It appears that freehand percussion was likely the most important technique in generating the quartzite debitage (Figure 3.143). The plot for quartzite comes out higher in terms of the percentage of small, cortical flakes than the average for all the quartzite flakes recorded in the survey. This pattern suggests that early-stage lithic reduction of quartzite was primarily responsible for the quartzite debitage. The counts for the remaining material types were too low for meaningful analysis.

Unfortunately, no diagnostic materials, such as projectile points or ceramics, were recorded from the site. The tool assemblage consists of two utilized flakes, one finished biface, and one non-bipolar core. Of the utilized flakes, one is obsidian and one is coarse-grained quartzite. The obsidian specimen exhibits heavy usage along the acute left lateral edge. The quartzite specimen shows light use wear on the distal end. Because the edge angle is less than 45 degrees, this tool was likely used for cutting. The biface is coarse-grained quartzite and is complete, with moderate use wear seen on both acute lateral edges. The non-bipolar core specimen is quartzite.

The ground-stone tool inventory from the site is rather significant. It includes three complete, irregular-shaped, sandstone metates; two complete, oval-shaped, sandstone manos; and a broken, oval-shaped, sandstone mano. Two of the manos (FS 6 and 9) have evidence of grinding and pecking. The remaining pieces of ground stone have evidence only of grinding.

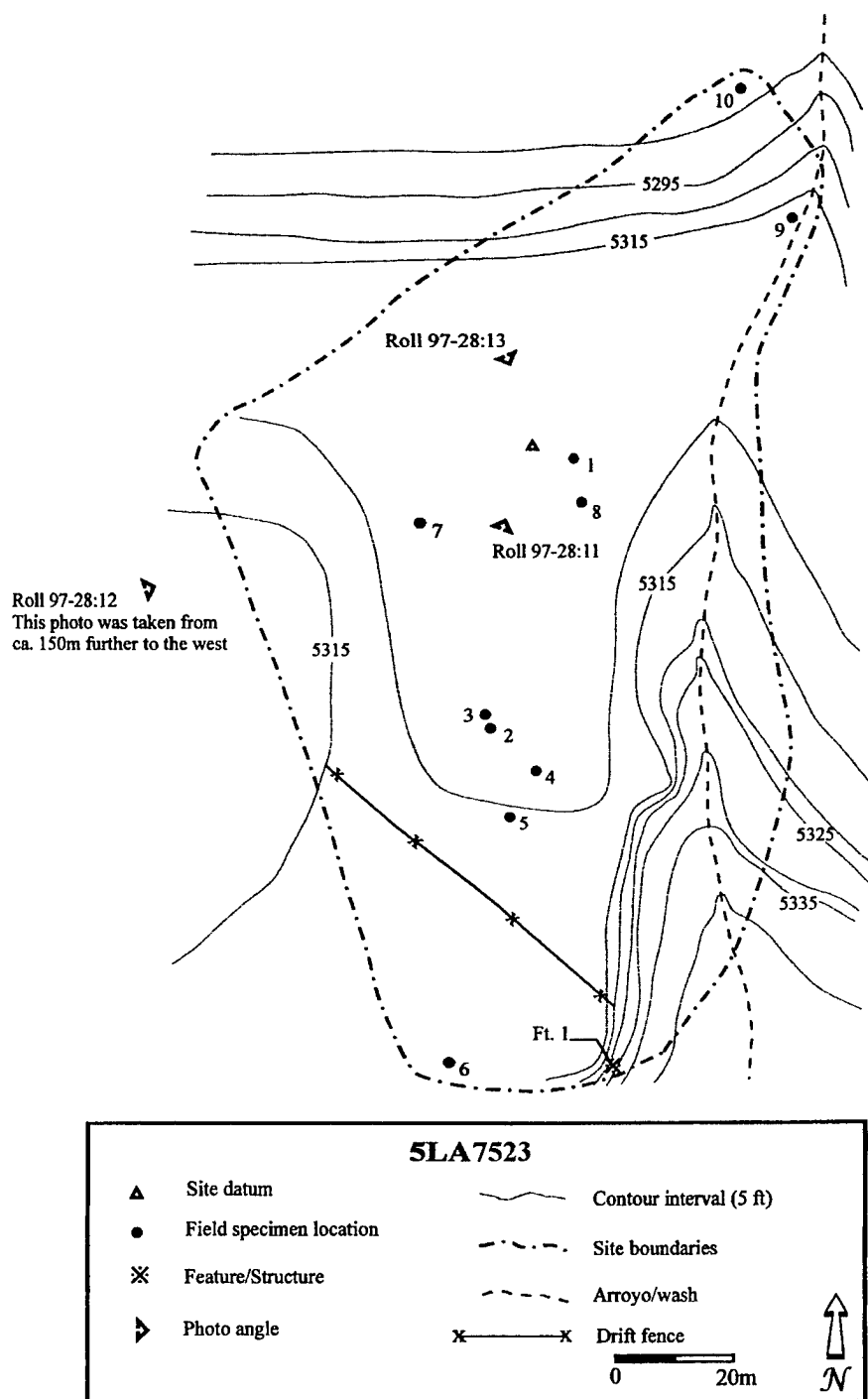


Figure 3.141: Site map, 5LA7523.

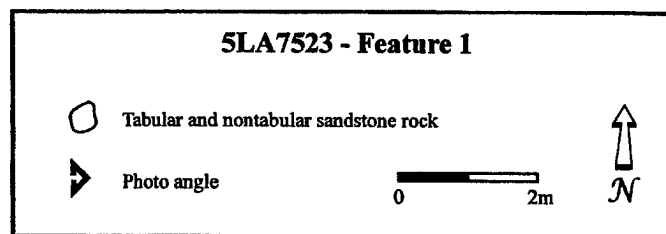
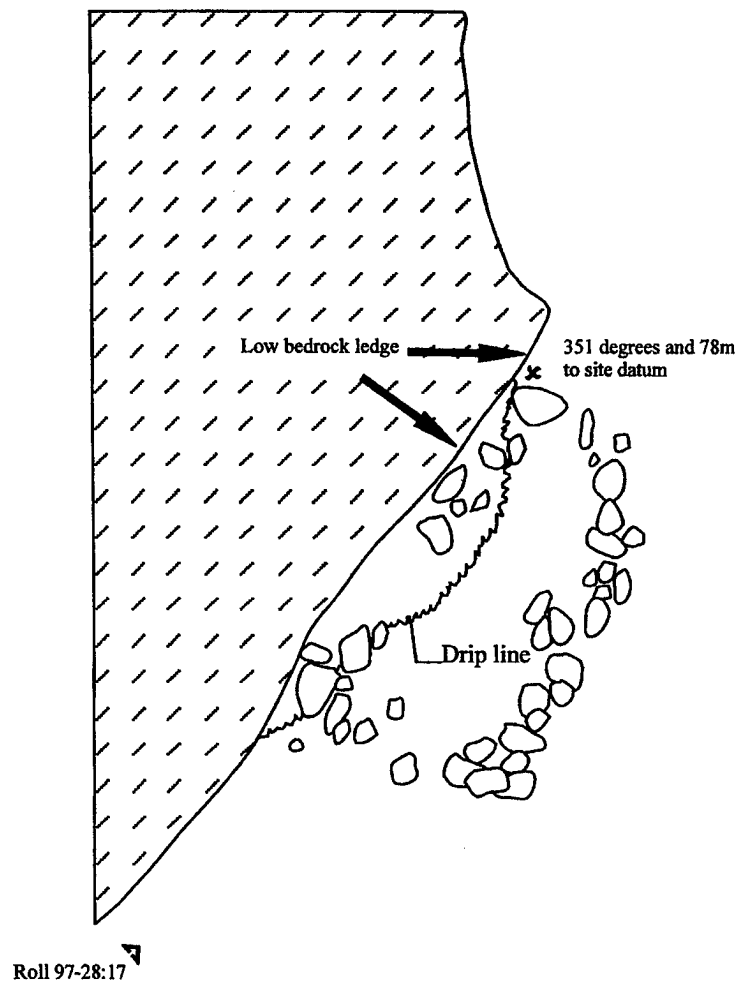


Figure 3.142: Planview of Feature 1, 5LA7523.

Table 3.35: Summary Description of Chipped-Stone Debitage for 5LA7523.

	Chert	Hornfels/Basalt	Obsidian	Quartz	Quartzite
Total flakes	15	2	1	1	167
Large	5	1	0	0	91
Small	10	1	1	1	76
Noncortical	9	1	1	0	79
Cortical	6	1	0	1	88
Bifacial thinning	0	0	0	0	0
Bipolar	0	0	0	0	0
Complex	0	1	0	0	31
Shatter	3	0	0	1	7
Simple	12	1	1	0	129

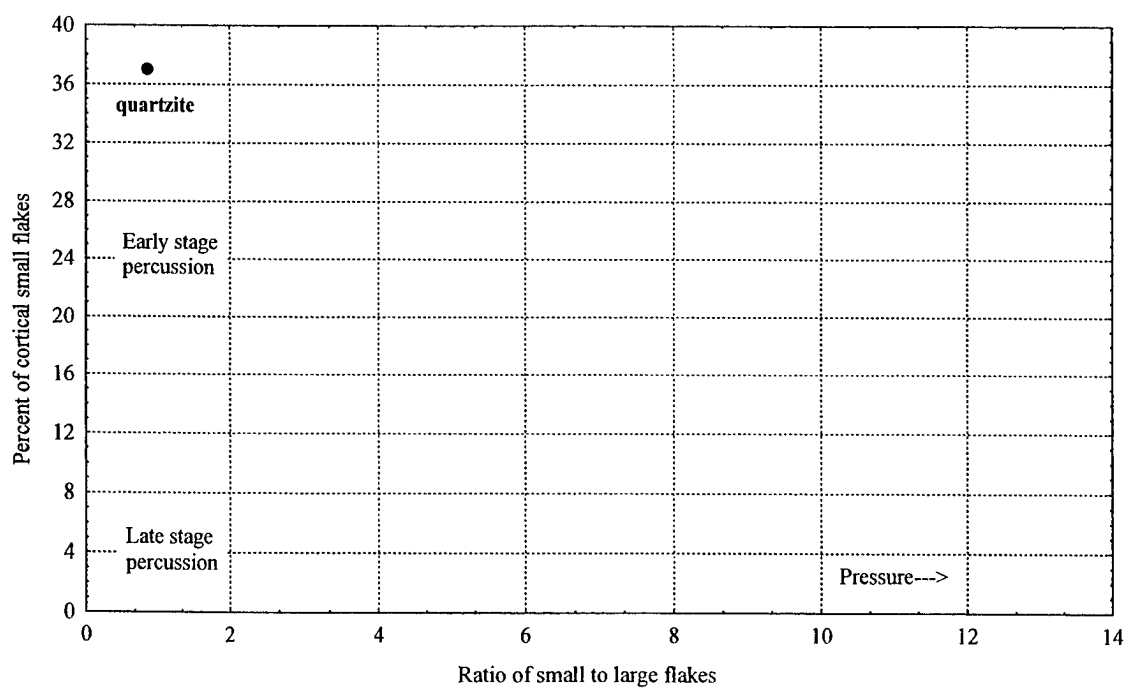


Figure 3.143: Plot of the quartzite debitage from 5LA7523.

A piece of obsidian (5LA7523.0.2) was collected approximately 10 m and 53 degrees from the datum. The specimen was submitted for sourcing (Appendix III) and the analysis indicates that the obsidian originally came from the Obsidian Ridge source locale of the southern part of the Jemez Mountains in New Mexico.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7523 is a large lithic scatter and structure site with a high artifact density. The site exhibits some deposition, especially around Feature 1 where at least 30 cm of deposition was noted. There is good potential for encountering buried cultural deposits within this rockshelter. The presence of ground stone indicates that plant processing may have occurred at the site and that there is a good potential for recovering macrobotanical and/or pollen material from test excavations. The presence of obsidian indicates that the site may yield data pertinent to the reconstruction of trade and exchange networks. The site should be evaluated through test excavations.

5LA7538

This site is a large lithic scatter located on the ridge around an unnamed drainage that flows eastward into Bent Canyon (Figures 3.144 and 3.145). The site overlooks a spring or seep and rock overhangs in the drainage. It has a historic component composed of a small scatter of historic trash near the site's southern edge. The site covers approximately 15 acres and is localized around the edges of the drainage. Some lithics were found in the drainage bottom at the upper reaches of the drainage and others less densely scattered to the west up and out of the drainage. The elevation of the datum is 1,615 m (5,300 ft) and ranges from a low of approximately 1,603 m (5,260 ft) to a high of 1,622 m (5,320 ft).

Juniper, piñon, mountain mahogany, *Rhus trilobata*, cholla, yucca, the *Opuntias*, *ptelea trifoliata*, side oats, blue grama, squirrel tail, cheat grass, and snakeweed were noted on the site in early July when it was recorded. Comparatively large piñon trees were noted as growing in and around the site area. These piñons were among the largest and tallest seen in the Black Hills. In order to get an idea of the density of these trees, the number of piñon trees in two 1-hectare areas at the datum were counted and yielded an average of 77 piñon trees per hectare. Based on these values, site 5LA7538 is situated in an area that has the highest density of piñon trees of any other area noted in the Black Hills Survey.

Soil deposits are thin at the edges of the eroded drainage where large areas of bedrock are exposed. In the western part of the site above, at the very head of the drainage, deposits of up to 40 cm in depth were noted.

The historic component appears to be trash hauled to the location from elsewhere. Bottle glass, broken dishes, window glass, and cut nails are in the trash. Based on the magnetic strip within the body of the window glass, it is recent and not significant.

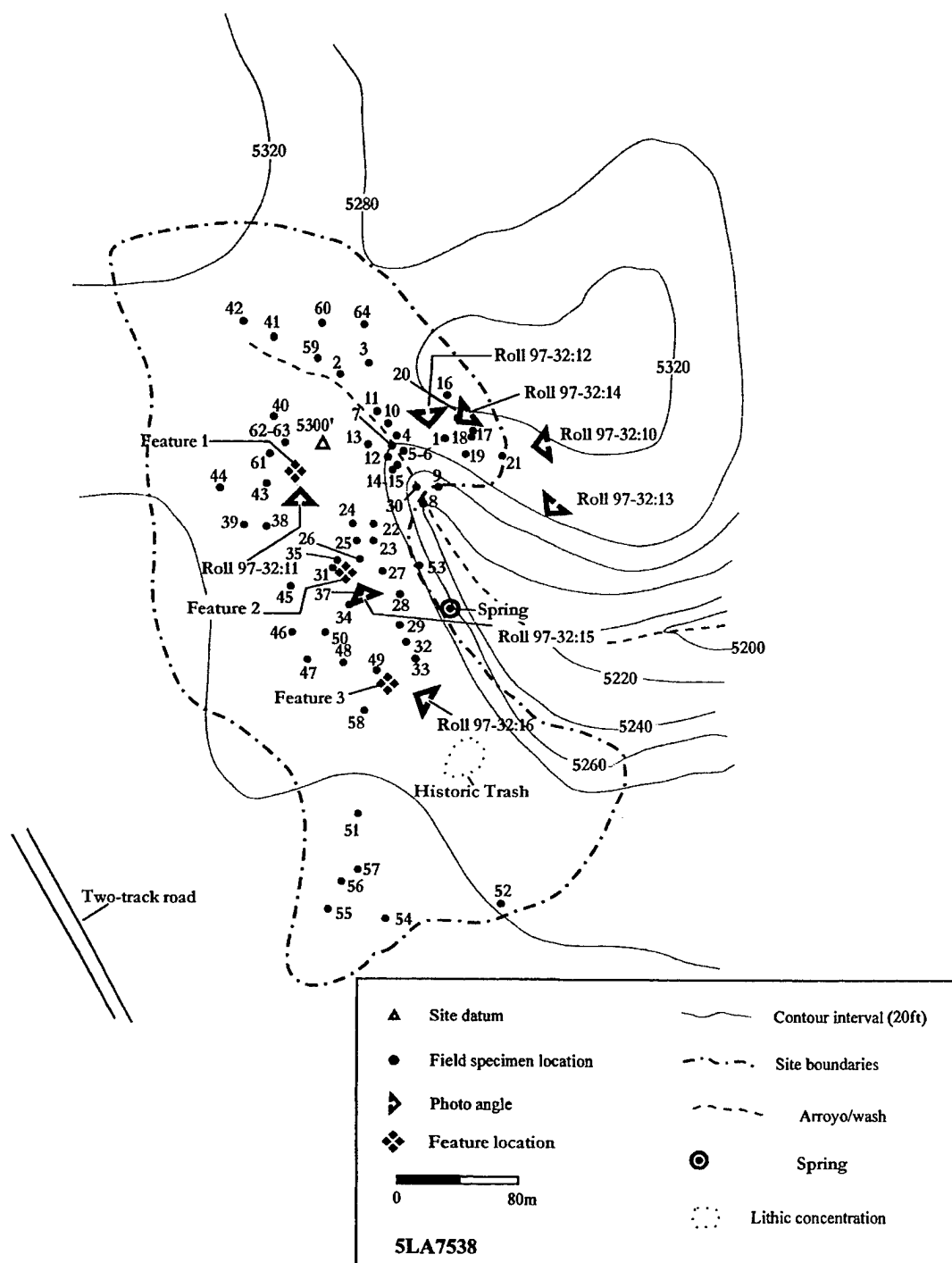


Figure 3.144: Site map, 5LA7538.

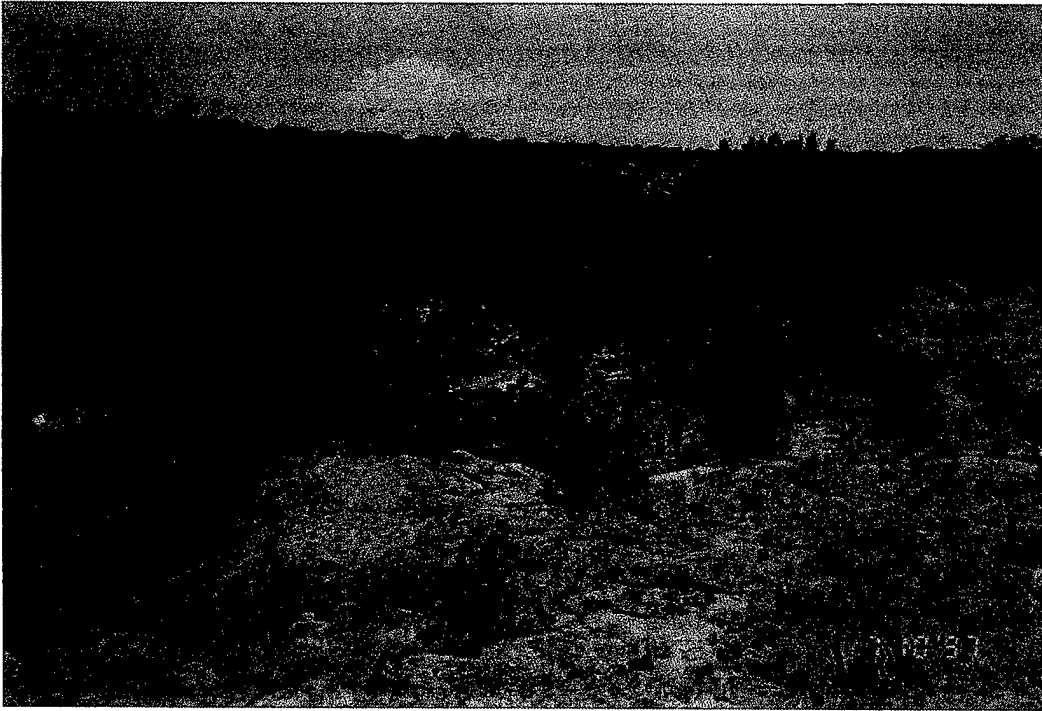


Figure 3.145: Site overview of 5LA7538 toward datum at 288°.

Three prehistoric features were recorded at the site, all of which appear to be middens or perhaps hearths. Each is primarily composed of darkened soil with some ash and thermally altered rocks. Feature 1 measures 6 x 2.5 m, Feature 2 is 5 m in diameter, and Feature 3 is 3 m in diameter. Prehistoric artifacts were recorded around each of the features.

A total of 160 pieces of chipped-stone debitage were recorded from the site (Table 3.36). Of the total, 80% is quartzite and 17% is chert. Of the quartzite debitage, 66% is the large size grade, while the remaining 34% is small; 29% of the debitage has cortex and 71% is noncortical; and 84% is recorded as simple flakes, 14% as complex flakes, and 2% is shatter. Of the chert debitage, 41% is large and 59% is small; 19% is cortical and 81% is noncortical; and 59% is classified as simple, 7% as complex, and 33 is shatter.

For the most part, freehand percussion was the most important technique in generating the debitage of the two material types (Figure 3.146). The relatively low percentage of cortical, small flakes, suggests that quartzite tool manufacture/maintenance occurred at the site. This conclusion is supported by the presence of several quartzite bifaces, retouched/utilized flakes, and projectile points. The high overall percentage of quartzite cortical flakes (41%) may indicate that core reduction occurred at the site. Site 5LA7538 is one of the few situations in which the percentage of small, cortical chert flakes is higher than the percent of small, cortical quartzite flakes. Based on the plot of chert, early-stage lithic reduction was an important factor in generating the chert debitage at the site. This conclusion is supported by the relatively high percent of chert shatter (33%) at the site.

Table 3.36: Summary Description of Chipped-Stone Debitage for 5LA7538.

	Chalcedony	Chert	Hornfels/Basalt	Quartzite	Siltstone
Total flakes	3	27	1	128	1
Small	2	16	1	44	0
Large	1	11	0	84	1
Cortical	0	5	0	37	1
Noncortical	3	22	1	91	0
Simple	3	16	1	107	1
Complex	0	2	0	18	0
Shatter	0	9	0	3	0
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0

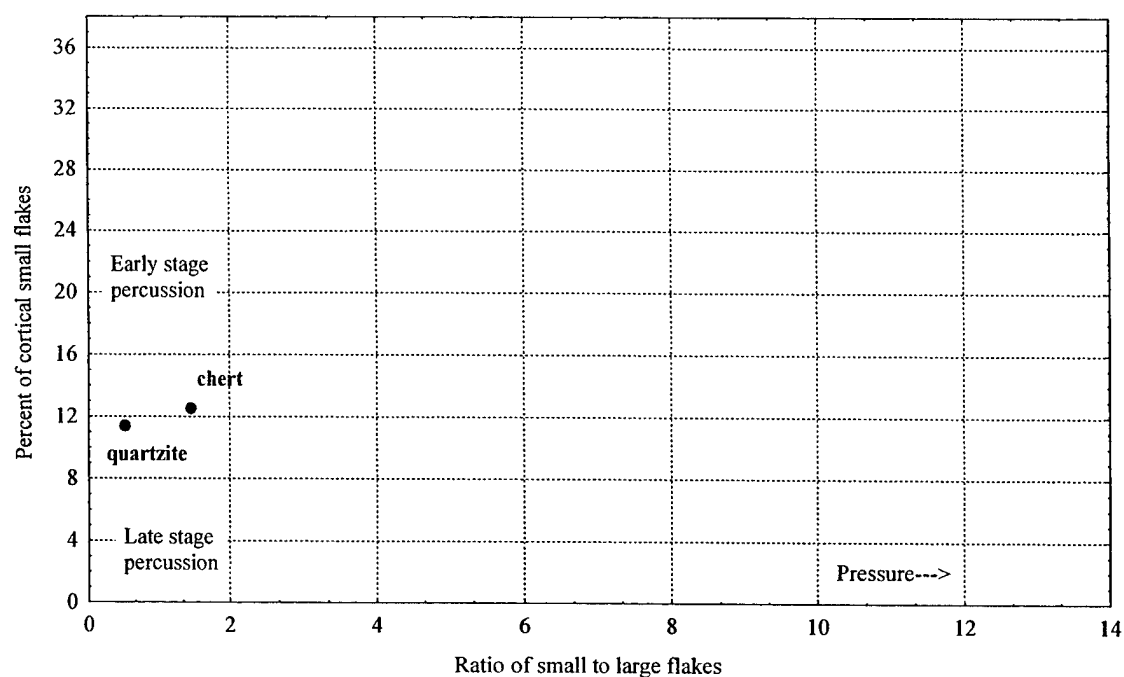


Figure 3.146: Plot of the debitage for 5LA7538.

Table 3.37: List of Temporally Diagnostic Projectile Points from 5LA7538.

Field Specimen No.	Catalogue No.	Anderson (1989) Type	Start Date Years A.D.	End Date Years A.D.
4	7538.0.4	P50	1000	1750
17	7538.0.17	P49	800	1750
18	7538.0.18	P58	600	1200
24	7538.0.24	P59	500	1200
25	7538.0.25	P59	500	1200

Five diagnostic projectile points were recovered from site. All five of the projectile points are relatively late (Table 3.37) and suggest that the site was occupied at some time during either the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500) or the Late Ceramic stage (A.D. 1500 to A.D. 1750). An earlier occupation during the Early Ceramic stage (A.D. 200 to A.D. 800/1000) is also possible.

The stone-tool assemblage of 39 artifacts consists of 19 non-bipolar cores, nine bifaces, six bifacial core-tools, three retouched uniface tools, one end/side scraper, and one drill. Because the cores and core-tools were analyzed in the field, only the material type was recorded. Material types for the cores are chert (10), quartzite (8), and argillite (1). The core-tools are four quartzite specimens, one limestone specimen, and one argillite specimen.

Of the bifaces, eight of the nine specimens are broken. The majority are chert (3) and fine-grained quartzite (3), with fewer coarse-grained quartzite (2) and siltstone (1) specimens noted. Four of the bifaces are classified as unfinished, three are nearly finished, and two are finished bifaces. Only three of the biface specimens exhibit use wear. The nearly finished, coarse-grained quartzite specimen shows light cutting (< 45-degree) use wear on the right lateral edge and the distal end. The finished, fine-grained quartzite specimen exhibits moderate use wear along the acute (< 45-degree) distal end. The remaining specimen is a nearly finished, fine-grained quartzite biface with light cutting (< 45-degree) use wear along the left lateral edge.

All of the uniface tools are complete. Two of the three are made of quartzite, and one is kaolinite. The kaolinite specimen looks more like an unfinished jewelry item, with distinct retouch modification and no visible use wear. The fine-grained quartzite uniface is finished and shows light use wear on the steep right lateral edge. The coarse-grained quartzite specimen is nearly finished and exhibits light use wear on the steep left lateral edge.

The remaining two artifacts are one end/side scraper and one drill. The end/side scraper is complete and classified as finished. Heavy retouch modification and use wear is seen on both lateral edges and the distal end. The drill is a bit fragment from a finished tool. Heavy, steep retouch and light use wear are seen on the lateral edges.

Site 5LA7538 also yielded a total of 30 body sherds and one rim sherd from a single vessel (Appendix II). The vessel is likely a plain, concoidal jar with a rounded lip. The exterior surface exhibits some striations, the result of wiping the surface while it was in a plastic state.

Fourteen pieces of ground stone were recorded at the site. Three of these are flat, slab metates, one is a bedrock metate, nine are manos, and one is a polished, quartzite stone. The manos have surfaces that are either ground or ground and battered, suggesting that some may have been used as hammerstones.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7538 is a lithic scatter with thermal features (Features 1-3) that may be hearths or midden areas. Some areas of the site exhibit soil depths of up to 40 cm. The site is large, with a high artifact count and density. There is a good probability of finding intact cultural deposits that may include pollen and macrobotanical remains. Test excavations in or near the features could yield important data for the reconstruction of subsistence patterns and/or paleoenvironment. Diagnostic artifacts, useful for addressing issues about chronology were located and they indicate the possibility of more in buried contexts. We suggest that the site be revisited for more detailed mapping and surface collection. The areas around Features 1-3 are likely to yield subsurface cultural deposits, and they should be test excavated.

5LA7548

This site is a large lithic scatter and structure site located on the ridge top at the head of an unnamed, southwest-to-northeast trending drainage of Bent Canyon (Figure 3.147). The site is on the ridge top overlooking the tributary. No evidence was noted that would indicate the boundaries extend down into the canyon, even though there are several areas in the canyon walls that would be excellent locations for rockshelter occupation. It is likely that a seep or spring is located somewhere in the canyon sides, but none was actually seen in the course of our fieldwork. The site covers an area of approximately 15.3 acres and stretches around the head of the drainage from one side to the other. The datum was placed at an elevation of about 1,622 m (5,320 ft) asl and topographic relief within the confines of the site boundary ranges between 1,628 m and 1,622 m (5,340 to 5,320 ft) asl.

Juniper, yucca, mountain mahogany, blackfoot daisy, sulfur flower, lamb's quarters, grama grasses, purple three-awn, prickly pear, and snakeweed were growing on the site in early July when it was recorded. The vegetative community surrounding the site is the juniper scrub typical of the Black Hills. Soil depths vary considerably across the site and range from exposed bedrock to about 40 cm.

Two structures (Features 3 and 4) were recorded at the site. Feature 3 is a structure composed of a semi-circular alignment of sandstone slabs in front of a low, exposed ledge of sandstone bedrock along its west side. The structure measures approximately 4 x 3 m. Feature 4 is a somewhat disturbed structure composed of sandstone slabs measuring 4 x 3.5 m. This structure is not nearly as well defined and obvious as Feature 3. Each structure is within 12 m of the cliff edge, and because of this criterion, they are typed as Class I, cliff edge placement units (Kalasz 1989:96). According to Campbell (1969:338, 389, 392), these structures are defensive in character and they date to approximately A.D. 1000 to A.D. 1400. If accurate, the site was used in the Middle Ceramic stage (A.D. 800/1000 to A.D. 1500).

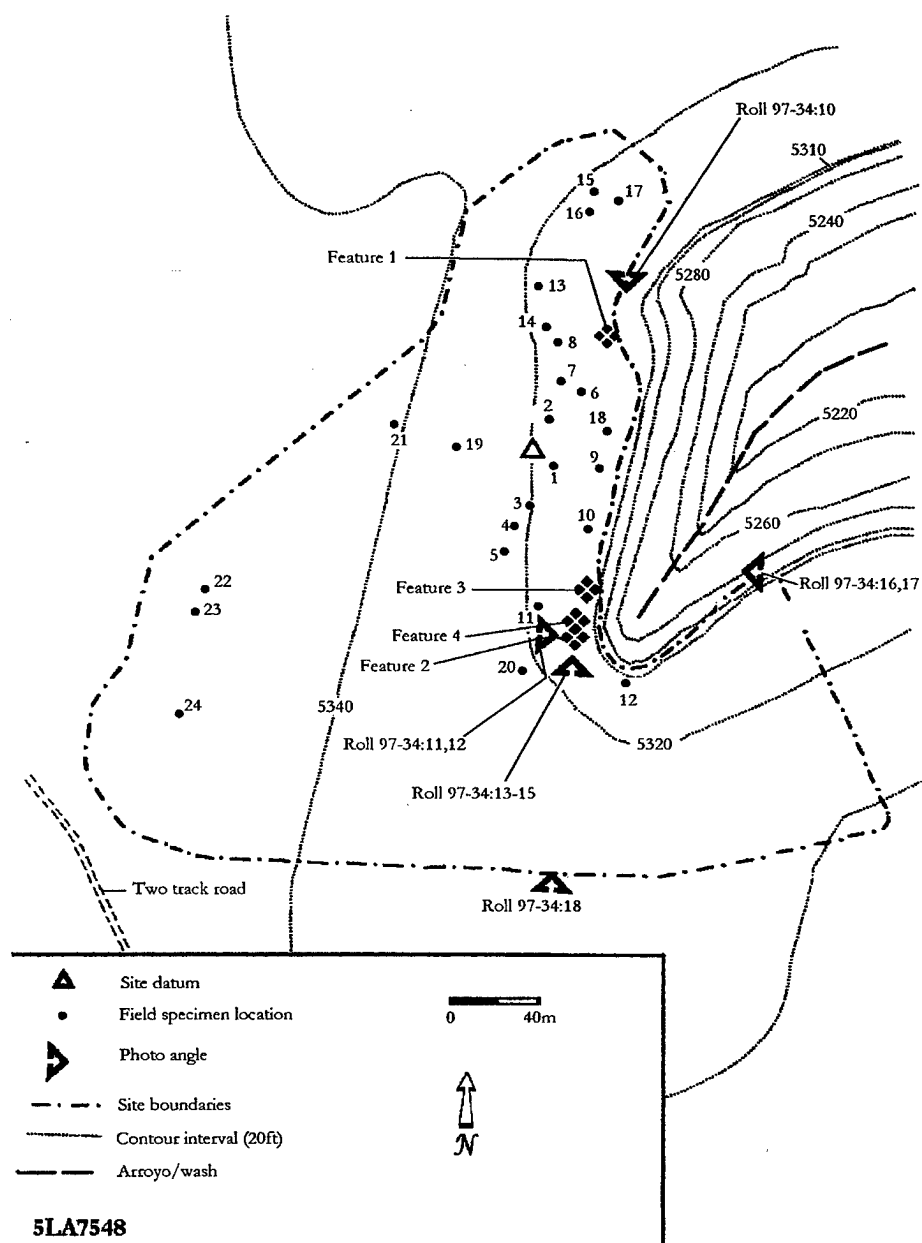


Figure 3.147: Site map, 5LA7548.

Two possible hearths were also noted at the site. Feature 1 is an area measuring 8 x 5 m and is comprised of ashy soil and thermally altered rock. This feature may have as much as 30-40 cm of deposition and would be a good location for test excavations. Feature 2 measures approximately 5 m in diameter and is also comprised of ashy soil and thermally altered rocks. This feature is adjacent to Feature 4, and it appears that some of the deposits from Feature 2 are scattered inside the walls of Feature 4. The area around these features, which are located about 65 m south of the site datum, had the highest artifact density on the site.

A total of 160 pieces of chipped-stone debitage were recorded from the site (Table 3.38). Of the total, 69% is quartzite and 19% is chert, 7% is argillite, 4% is hornfels/basalt, and 1% is chalcedony. Of the quartzite debitage, 72% sorts into the large size grade while the remaining 28% is small; 52% of the debitage is noncortical and 48% has cortex; and 14% is recorded as complex flakes, 8% as shatter, and 78% as simple flakes. Of the chert debitage, 53% falls into the large size grade, while 47% is recorded as small; 67% of the debitage is noncortical and 33% has cortex; and 13% is recorded as complex flakes, 43% as shatter, and 43% as simple flakes.

Freehand percussion generated the debitage of the two material types (Figure 3.148). Both chert and quartzite plot high with regard to the percentage of small, cortical flakes, suggesting that the early stages of lithic reduction were responsible for a good deal of the site's debitage. Even though the frequency of small chert flakes is low (14), we believe that core reduction and/or chert procurement were activities carried out at the site. The presence of three chert cores and the high percentage of chert shatter support this inference. Four quartzite cores or core/tools and a high percentage of cortical flakes suggest that quartzite procurement was also an activity carried out at the site.

Two diagnostic projectile points were recorded from the surface of the site. The first point (5LA7548.0.3) is similar to Anderson's (1989) type P53. This type is associated with dates that range between A.D. 700 to A.D. 1200. The second projectile point (5LA7548.0.6) is a P58 and ranges in time between A.D. 600 and A.D. 1200. Based on these two artifacts, the site had an occupation in the Early to Middle Ceramic Stage (A.D. 200 to A.D. 1500). The additional presence of cliff edge structures at the site supports a Middle Ceramic stage occupation.

The tool assemblage consists of 14 artifacts. Of these, seven are non-bipolar cores, three are bifaces, two are retouched uniface tools, and two are bifacial core-tools. Four of the cores and one of the core-tools are quartzite. The remaining cores are chert, and the core-tool is argillite. Two bifaces are chert, and one is a coarse-grained quartzite. All are broken, with no visible use wear. Reduction stages for the bifaces are two unfinished and one nearly finished specimen. Both uniface tools are fine-grained quartzite, complete, and classified as nearly finished. Both show scraper usage on the steep lateral edges.

Nine pieces of ground stone were recorded at the site. All are manos, with one showing distinct edge grinding. Four of the manos are ground and pecked, and the others are only ground, except for FS 9, which exhibits battering. One of the manos was made from vein quartz (FS 17).

Table 3.38: Summary Description of Chipped-Stone Debitage for 5LA7548.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Quartzite
Total flakes	11	2	30	7	110
Large	7	1	16	4	79
Small	4	1	14	3	31
Noncortical	5	1	20	4	57
Cortical	6	1	10	3	53
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0
Complex	2	0	4	2	15
Shatter	3	0	13	0	9
Simple	6	2	13	5	86

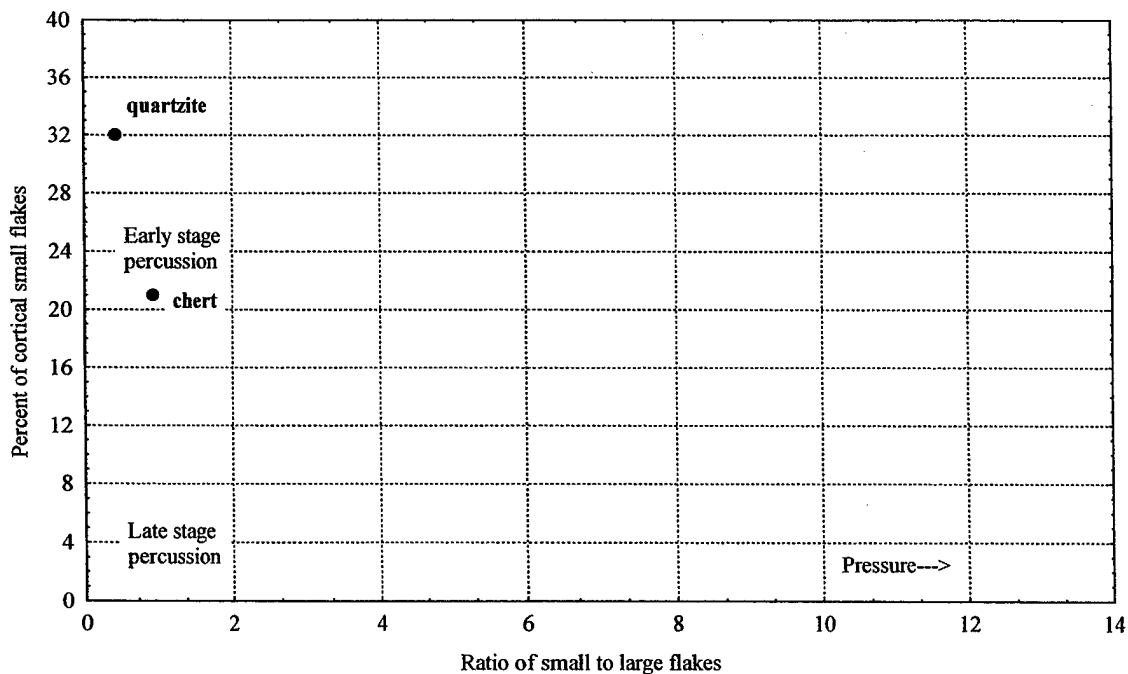


Figure 3.148: Plot of the chert and quartzite debitage from 5LA7548.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7548 is a large lithic scatter and structure site with thermal features (Features 1 and 2) that are likely hearths. Feature 1 has soil depths of about 40 cm and may contain subsurface cultural deposits. Artifact classes potentially present in this feature include pollen, macrobotanical, and faunal remains. These classes are useful in addressing research questions about subsistence and paleoenvironment. The presence of structures and evidence suggesting raw material procurement indicate the potential for addressing issues regarding regional settlement systems. We recommend the site be mapped in detail and test excavations completed in or around the hearths and structures (Features 1-4). If intact deposits are encountered, then the site should be fenced for its protection.

5LA7582

This site is a lithic scatter located at the southeastern end of the Black Hills. The site is set along the canyon edge facing south into a wide, circular draw carved out by a tributary of Welsh Canyon. The approximately 1-acre site is centered on a drainage that flows from the northwest to the southeast. The site datum is at an elevation of approximately 1,625 m (5,330 ft). The lowest part of the site is along the cliff edge at approximately 1,624 m (5,328 ft), while the highest portion of the site is in the northwest corner at an elevation of about 1,630 m (5,348 ft). Only a small portion of the site (in the northwest corner) is actually within the PCMS training area. The portion of the site to the east and south of the fence indicated in Figure 3.149 is outside the currently established training area.

Juniper, piñon, yucca, mountain mahogany, scrub oak, prickly pear, cholla, and grama grasses were noted on the site when it was recorded. The vegetative community surrounding the site is the juniper scrub typical in the Black Hills. Soil depth varies across the site and ranges from exposed bedrock to about 30 cm.

A single feature was recorded at the site (Feature 1). This possible hearth/roasting pit is composed of ashy soil and thermally altered rocks measuring approximately 5 m in diameter. It is located approximately 15 m and 160 degrees from the datum. A rather dense concentration of artifacts was noted in a small drainage on the edge of a point that extends toward Welsh Canyon.

A total of 160 pieces of chipped-stone debitage were recorded from the site (Table 3.39). This total comes from a rather confined (2-x-7 m) area within the artifact concentration described above. Of the total, 88% is quartzite and 11% is chert, and there is one flake each of chalcedony, hornfels/basalt, and limestone. These figures may be skewed by the small area of the site that was selected for the sample, and the impression during fieldwork was that a greater diversity of material types was present. Of the quartzite debitage, 74% falls into the large size grade, while the remaining 26% is recorded as small; 56% of the debitage is noncortical and 44% has cortex; and 6% is recorded as complex flakes, 9% as shatter, and 86% as simple flakes.

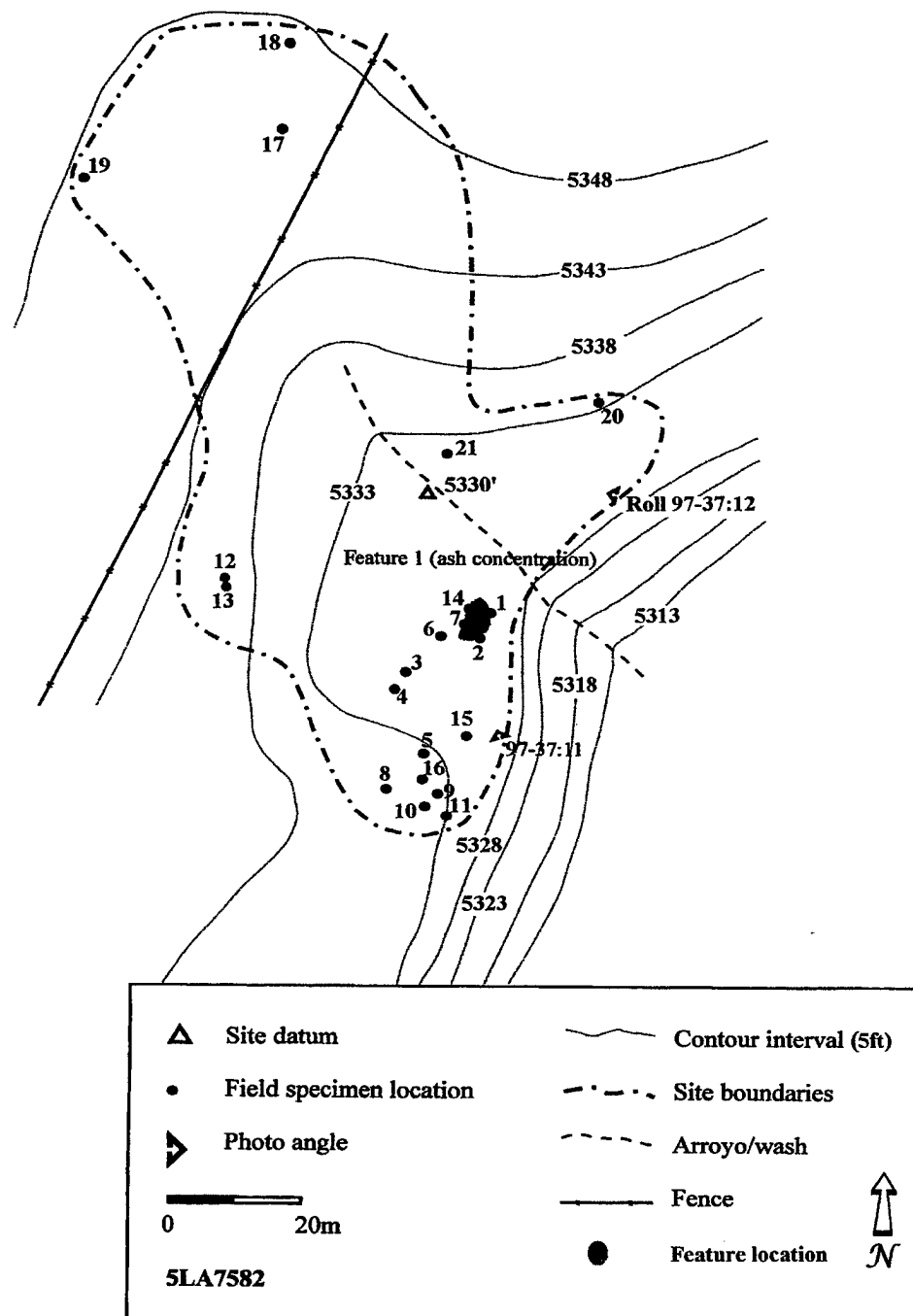


Figure 3.149: Site map, 5LA7582.

Table 3.39: Summary Description of Chipped-Stone Debitage for 5LA7582.

	Chalcedony	Chert	Hornfels/Basalt	Limestone	Quartzite
Total flakes	1	17	1	1	140
Large	0	10	1	0	103
Small	1	7	0	1	37
Noncortical	1	11	1	1	78
Cortical	0	6	0	0	62
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0
Complex	0	1	0	0	8
Shatter	0	7	1	0	12
Simple	1	9	0	1	120

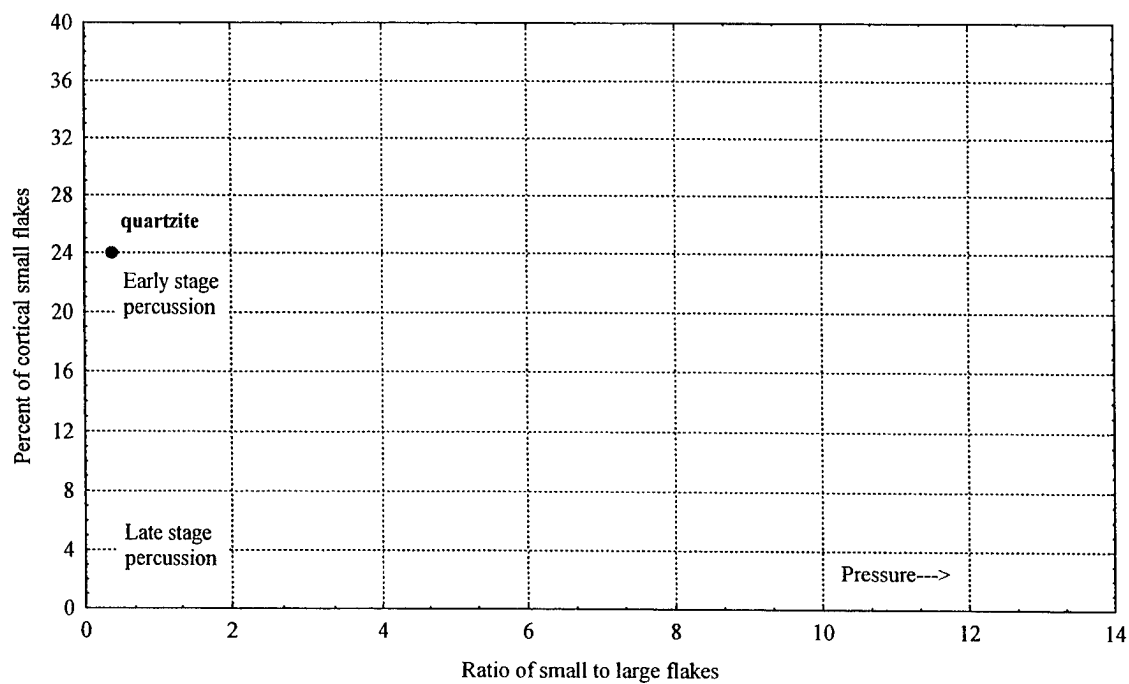


Figure 3.150: Plot of the quartzite debitage from 5LA7582.

Freehand percussion was likely the most important technique in generating the debitage (Figure 3.150). The quartzite plots only slightly lower than the average percent of small cortical flakes for the entire survey. The relatively high percentage of cortical flakes (including cortical, large flakes) and shatter suggests that early-stage reduction was common in the area sampled. This inference is further supported by the presence of eleven quartzite cores and core/tools at the site. Even though the frequency of chert is low (17), the presence of six cortical flakes, seven pieces of shatter, and a chert core suggest that some early-stage reduction of chert cores was carried out at the site. Based on this information, one of the primary site functions was the procurement of raw materials such as quartzite and chert. Counts of the remaining material types are too low for meaningful analysis.

Unfortunately, no diagnostic materials, such as projectile points or ceramics, were recorded from the site. The tool assemblage consists of 16 artifacts. Of these, nine are non-bipolar cores, three are large core-tools, one is an end/side scraper, one is a side scraper, one is a retouched uniface tool, and one is a biface. Eight of the nine cores and all of the core-tools are quartzite. The remaining core is chert. The unfinished biface is coarse-grained quartzite, complete, and shows no visible use wear. The end/side scraper is made of fine-grained quartzite and classified as finished. Heavy retouch modification and light to moderate use wear is seen on both lateral edges and distal end. The complete chert side scraper is classified as nearly finished, with moderate use wear on one irregular edge. The retouched uniface tool is coarse-grained quartzite, classified as unfinished, with distinct retouch modification and no visible use wear present.

The inventory of ground-stone tools includes three flat, irregular-shaped, sandstone metates, all broken; a broken, oval-shaped quartzite mano (FS 2); and a broken oval-shaped sandstone mano (FS 18). Several of these tools display evidence of heavy use. The oval-shaped mano (FS 2) appears to have been used for battering and may have served as a pestle.

We recommend that this site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7582 is a lithic scatter with a high artifact density and a thermal feature, which is likely a hearth or roasting pit. Feature 1 has a high probability of yielding charcoal or carbon useful for dating and chronological purposes. The feature deposits may yield pollen, macrobotanical, and faunal remains, which combined with the presence of ground stone, indicates a high probability of recovering information for the reconstruction of subsistence practices and paleoenvironment. Only a small portion of the northern part of the site is located within the mechanized training area. The features and high artifact density area are situated outside the currently established training area and are not threatened by military activities. That area within the training region is comprised primarily of a light scatter of lithics along a badly eroded drainage. There is little potential of encountering intact subsurface cultural deposits in this area. That section of the site that has potential for buried cultural deposits is currently protect by the PCMS boundary fence. Therefore, if the boundary fence remains, we recommend no further work at the site.

5LA7600

This is a large lithic scatter and structure site located at the far southern end of the Black Hills (Figure 3.151). The 2.7-acre site sits on the canyon edge facing east in a very large circular landform created by tributaries that drain into the Purgatoire River. The site extends from the lip of the canyon to the north and northwest up a low rise or knoll in the northern part of the site. The datum is at an elevation of 1,625 m (5,330 ft) asl. The knoll in the north rises only an additional 2 m. The entire site is located outside the current boundaries of the mechanized training area of the PCMS.

Yucca, grama grasses (side-oats and blue grama), prickly pear, juniper, and bunch grass were growing on the site when it was recorded. The vegetative community surrounding the site is the juniper scrub typical of most of the Black Hills. Deposits varied across the area of the site from exposed bedrock to depths of approximately 10 cm.

Two definitive structures were recorded at the site (Features 1 and 2). Feature 1 is a semicircular isolated room composed of sandstone slabs, measuring approximately 4 m across the outside diameter (Figure 3.152). The structure is approximately 32 m and 10 degrees from the site datum. An area of exposed bedrock is found to the north and northeast of the room. Seventeen field specimens were recorded in association with the structure. These items included chipped-stone tools, ceramics, ground stone, and a piece of worked kaolinite. Unfortunately, the structure exhibits deposits of only about 10 cm. The second structure (Feature 2) appears to conform to Kalasz's class of agglutinated structures because it is composed of two rooms with a contiguous wall (Figure 3.152). It is located about 21 m and 298 degrees from the site datum. Both rooms of the feature are circular and measure approximately 4 m in diameter. Soil deposits are found to a depth of approximately 20-30 cm within the confines of the feature. Several field specimens are also found associated with this feature, and they include chipped-stone tools and ground stone. Cores are found associated with Feature 2, but not with Feature 1. The two structures are composed of Class IV units, according to Kalasz (1989:108). Other similar structures have associated radiocarbon dates that extend from the Early to the Middle Ceramic stage (A.D. 200 to A.D. 1500).

A third feature (Feature 3) is located 4 m and 65 degrees from the site datum. It may be a hearth or roasting pit comprised of ashy soil and thermally altered rocks. The feature measures approximately 4 m in diameter. An area of unusually high artifact density is recorded in the northern portion of the site. The southern boundary for this high-density area is located approximately 80 m and 345 degrees from the site datum.

A total of 160 pieces of chipped-stone debitage were recorded from the site (Table 3.40). Of the total debitage, 63% is quartzite, 24% is chert, 8% is Alibates chert, 5% is hornfels/basalt, and there is one flake of argillite. Of the quartzite debitage, 79% is the large size grade, while the remaining 21% is small; 42% of the debitage is noncortical and 58% has cortex; and 8% is recorded as complex flakes, 8% as shatter, and 84% as simple flakes. Of the chert debitage, 42% is the large size grade, while the remaining 58% is small; 55% of the debitage is noncortical and 45% has cortex; and 26% is complex flakes, 5% as shatter, and 68% as simple flakes.

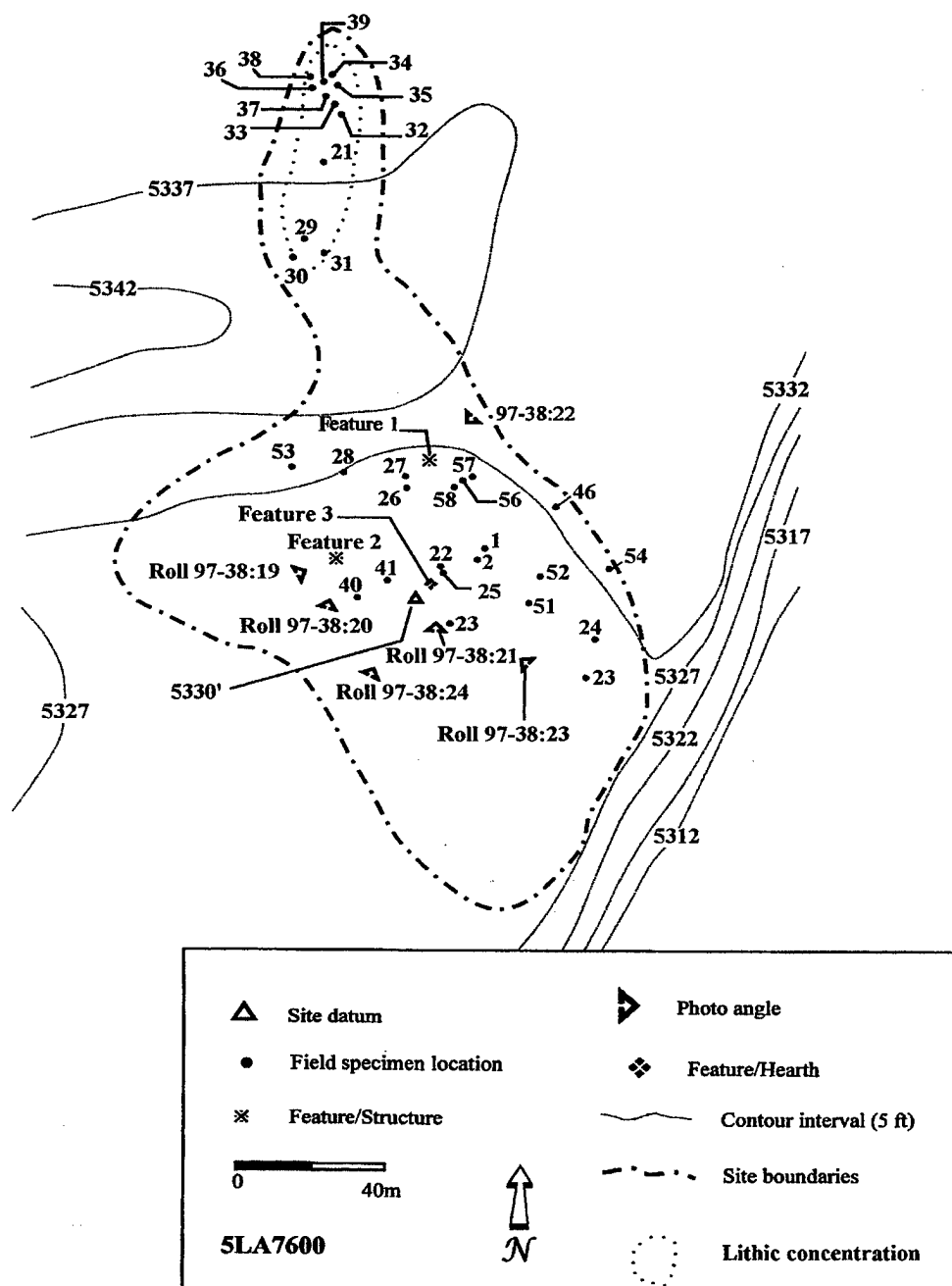


Figure 3.151: Site map, 5LA7600.

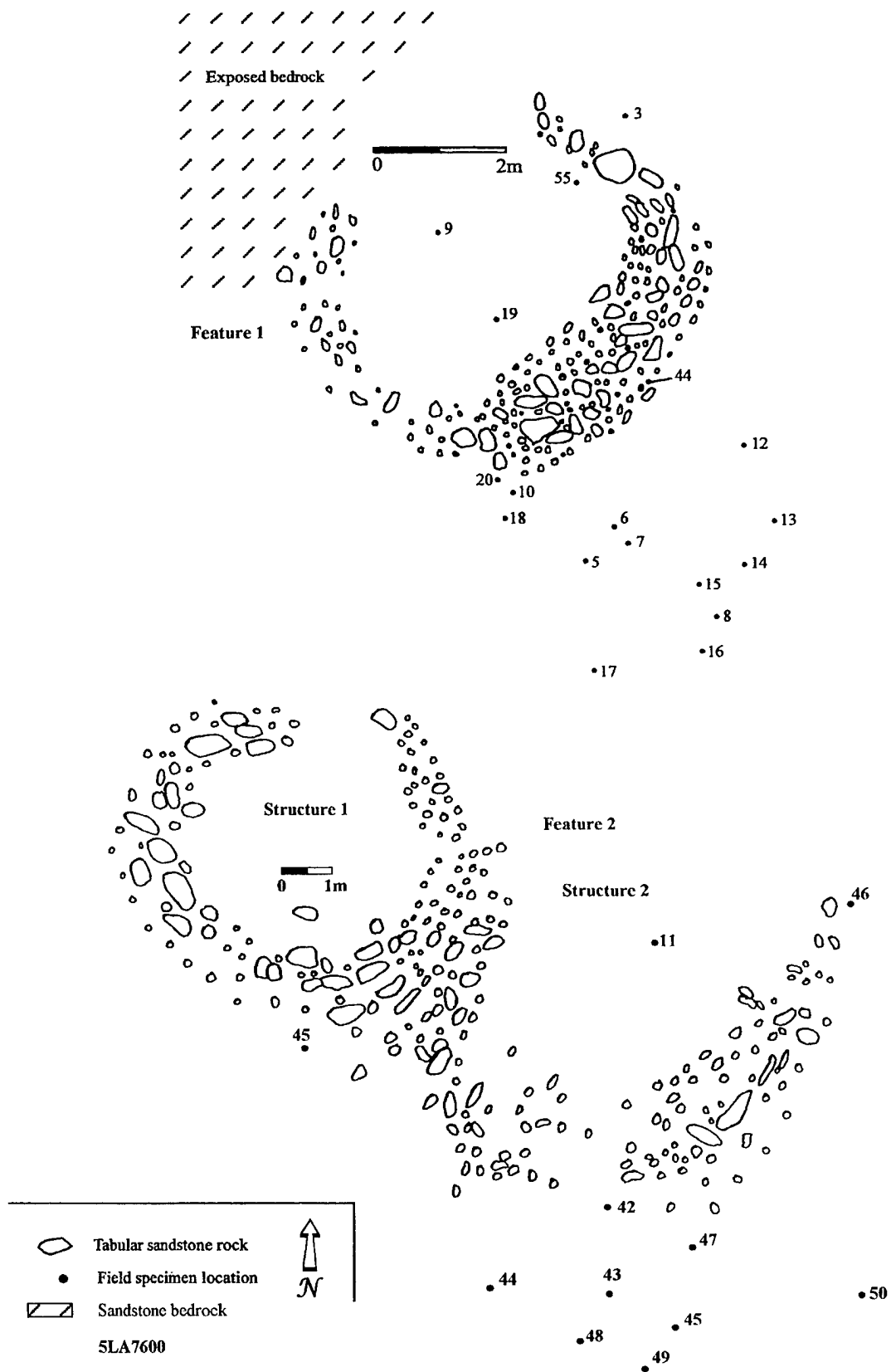


Figure 3.152: Planview maps of Features 1 and 2, 5LA7600.

Table 3.40: Summary Description of Chipped-Stone Debitage for 5LA7600.

	Alibates	Argillite	Chert	Hornfels/Basalt	Quartzite
Total flakes	12	1	38	8	101
Large	5	0	16	4	80
Small	7	1	22	4	21
Noncortical	7	1	21	3	42
Cortical	5	0	17	5	59
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0
Complex	1	0	10	1	8
Shatter	2	1	2	1	8
Simple	9	0	26	6	85

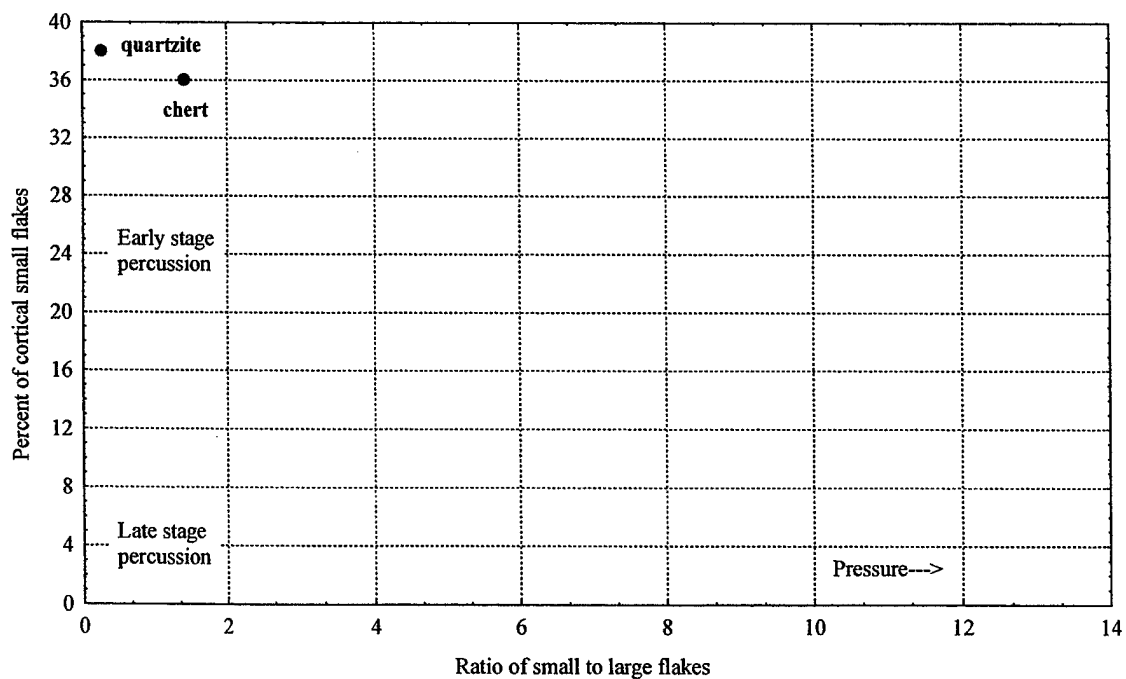


Figure 3.153: Plot of the chert and quartzite debitage from 5LA7600.

Figure 3.153 shows a scatter plot of the quartzite and chert debitage and Figure 3.154 shows the flakes from the structures –vs- the artifact concentration. Freehand percussion was the most important technique in generating both material types. The plot for the percentage of quartzite and the chert is higher for small, cortical flakes than the average for all the quartzite flakes recorded in the survey. This pattern suggests that early-stage lithic reduction of quartzite generated the debitage. However, three chert bifaces, one patterned chert tool, and one chert retouched/utilized flake were recorded from the artifact concentration. These tools suggest that tool use and perhaps some tool maintenance occurred around the area of the artifact concentration and may have been responsible for generating at least part of the chert debitage.

Ten of the 12 pieces of the Alibates chert were recovered around the artifact concentration. Two of the pieces are shattered, and they both have cortex. Alibates chert is somewhat rare, and this site has more than any other recorded in the Black Hills. Even though the count of Alibates is low, it does appear that an incident of early-stage reduction occurred in the area of the artifact concentration.

Four diagnostic projectile points were recorded from the surface of the site. Each projectile point is relatively recent in time. Two of them (5LA7600.0.9 and 5LA7600.0.30) are similar to Anderson's (1989) P49 type and have associated dates that range between A.D. 800 and A.D. 1750. Another projectile point (5LA7600.0.31) resembles Anderson's P83 type and has associated dates of A.D. 750 to A.D. 1650. The final projectile point (5LA7600.0.33) is similar to a P52 type and is associated with dates that range from A.D. 800 to A.D. 1350. Based on these artifacts, the site was occupied sometime during either the Middle or Late Ceramic stages (A.D. 800/1000 to A.D. 1750).

The stone-tool assemblage consists of 25 artifacts, of which seven are core-tools, seven are bifaces, six are non-bipolar cores, two are retouched uniface tools, one is a utilized flake, one is an end scraper, and one is a drill. Because the cores and core-tools were analyzed in the field, only the material type is recorded. Material types for the core-tools are chert (4) and quartzite (3). The cores are three quartzite specimens, one chert specimen, one claystone specimen, and one chalcedony specimen.

Of the bifaces, four of the seven specimens are broken. The majority are fine-grained quartzite (3), with fewer chert (2), chalcedony (1), and siltstone (1) specimens represented. Four bifaces are classified as unfinished, two are finished bifaces, and one is nearly finished. No use wear was evident. One uniface tool is nearly finished and one is an unfinished specimen. The nearly finished artifact is fine-grained quartzite and broken. Light to moderate use wear is seen on the distal end and right lateral edge. The unfinished specimen is fine-grained quartzite, with no visible use wear.

The remaining three artifacts include one utilized flake, one end scraper, and one drill. The utilized flake is fine-grained quartzite and is broken. Light use wear is seen along the acute (< 45-degree) left lateral edge. The complete end scraper is chert, and it is classified as finished. Distinct retouch modification and light use wear is seen on the distal end. The drill is a bit fragment from a finished tool. Heavy retouch modification and use wear is seen on the steep lateral edges.

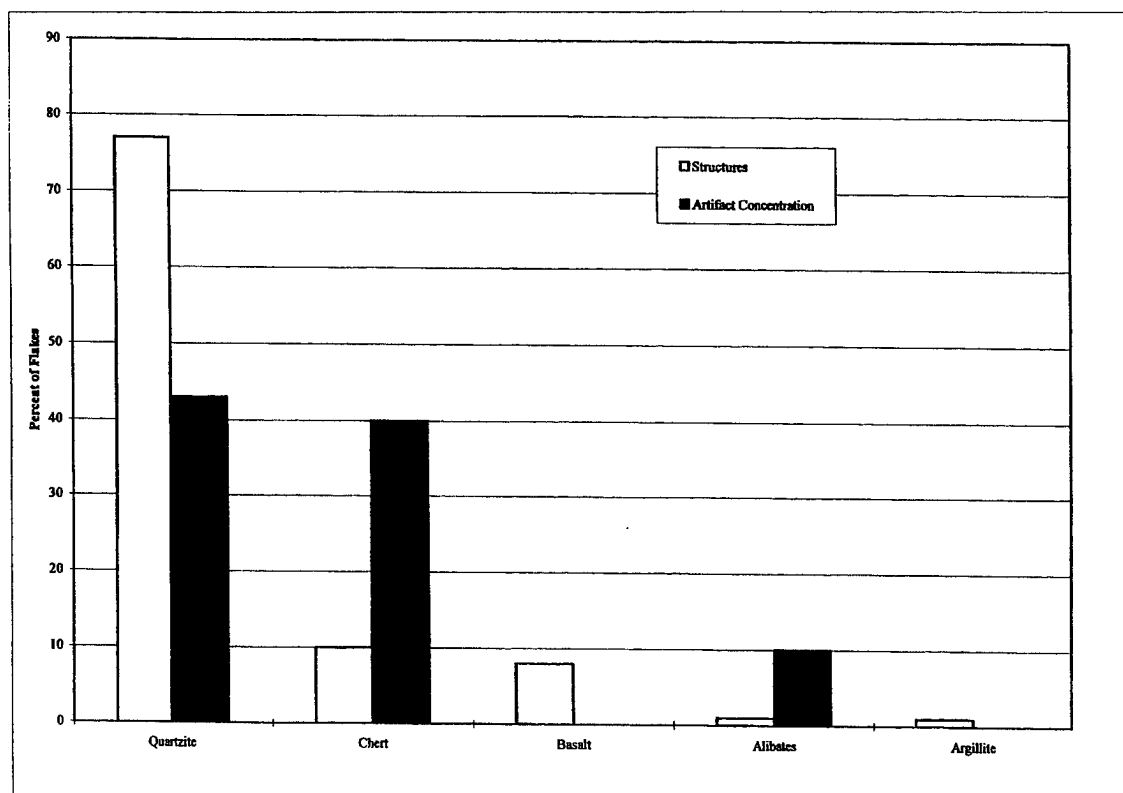


Figure 3.154: Graph showing the flakes from structures and artifact concentration.

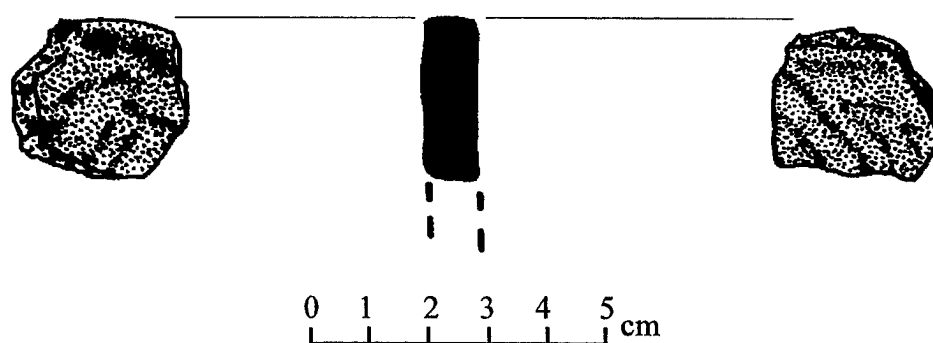


Figure 3.155: Ceramic sherd from 5LA7600. Cord-marked rim sherd (5LA7600.0.18) from Vessel 3.

Six body sherds (FS 18 and 19) were found in association with Feature 1 (Figure 3.155). The sherds belong to a single cord-marked vessel (Appendix II). The vessel form cannot be determined from the extant sherds. These sherds resemble Hummer's (1989) Category 4, which can be cross-dated to similar types from the Middle Woodland Upper Republican (Plains Village period, A.D. 1050-1450) or Middle Woodland Apishipa phase pottery (A.D. 1000-1300).

A worked piece of kaolinite (FS 20) was also recovered from Feature 1. This specimen may be a pendant or perhaps the foot of a small-footed vessel.

Fourteen pieces of ground stone were recorded at the site. Six of these are manos, six are metates, and two are edge-ground manos. Five of the metates are flat and better classified as grinding surfaces, and one is a shallow basin. Three of the metates exhibit grinding and pecking, while the other three have evidence only of grinding. One of the edge-ground manos has evidence of grinding and pecking (FS 4), and the other (FS 47) has evidence only of grinding.

We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA7600 is a lithic scatter and structure site (Features 1 and 2) that has a high artifact density area and a thermal feature (Feature 3), which is likely a hearth or roasting pit. Feature 3 has a good probability of yielding charcoal that can be used for dating and chronological purposes. The feature deposits may yield pollen, macrobotanical, and faunal remains, which, combined with the presence of ground stone, indicate a high probability of recovering information bearing on the reconstruction of subsistence practices and paleoenvironment. The structures provide important information that has a bearing on the reconstruction of the regional settlement system, and, while Feature 1 has shallow deposition, there still are probable subsurface cultural deposits within Feature 2. The presence of Alibates chert could provide information useful to reconstructing trade and exchange networks.

The entire site is located outside the boundaries of the mechanized training area of the PCMS, and therefore is not in imminent danger from military maneuvers. If the boundary fence remains where it is (ca. 750 m northwest of the site datum), we recommend no further work at the site.

5LA7604

This site is a large lithic scatter and rockshelter site located at the far southern end of the Black Hills. The nearly 4-acre site sits on the canyon edge facing south in a very large circular landform that was formed by several tributaries that drain into the Purgatoire River (Figure 3.156). The site extends over the canyon edge and incorporates the canyon walls and two small drainage areas in the east and west parts of the site. The datum is at an elevation of approximately 1,634 m (5,360 ft). Site elevations range from a high of about 1,637 m (5,372 ft) in the northern part of the site to a low of about 1,625 m (5,332 ft) along the cliff edge in the southern part of the site.

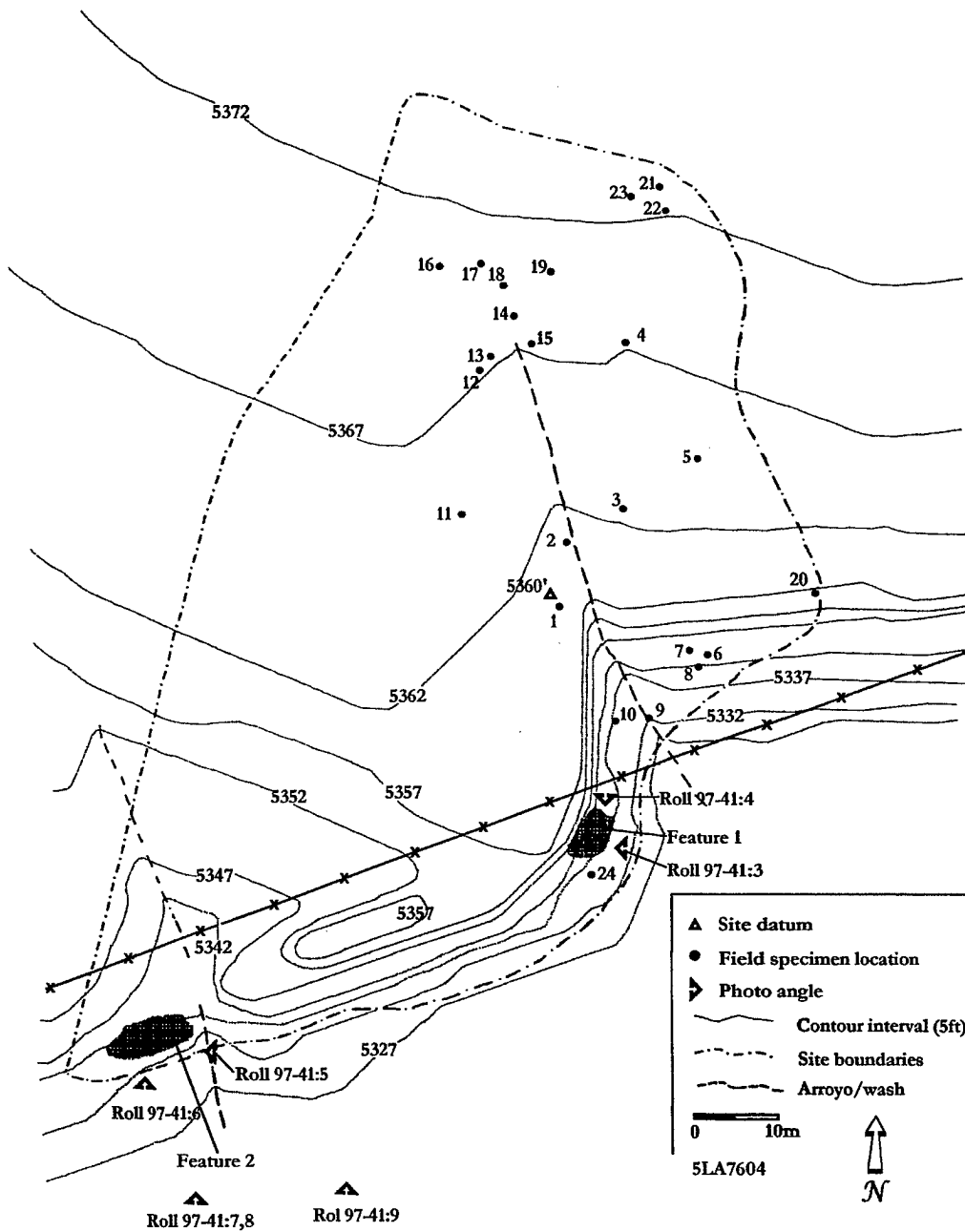


Figure 3.156: Site map, 5LA7604.

Yucca, prickly pear, cholla, piñon, juniper, mountain mahogany, grama grasses (blue, hairy, and side-oats), and even some ferns were growing on the site when it was recorded. The vegetative community surrounding the site is the juniper scrub typical of most of the Black Hills. Soil deposits varied across the area of the site from exposed bedrock to depths of approximately 20 cm.

Two rockshelters were recorded at the site (Features 1 and 2). Feature 1 is located about 45 m and 165 degrees from the site datum (Figure 3.157). The shelter faces to the southeast and overlooks a small drainage in the western part of the site. The 7-x-3.5-m shelter has a tabular and non-tabular sandstone block-enclosing wall along its dripline. Some ashy soil and thermally altered rocks, and some artifacts were found scattered down the talus slope in front of this shelter, but no cultural material was found on the surface within the shelter itself. Feature 2 is a 12.7-x-3.5-m shelter with large tabular and non-tabular sandstone boulders throughout its interior (Figure 3.157). The boulders do not appear to have been brought into the shelter or arranged in any noticeable pattern. A grinding surface (FS 25) is found on a boulder in the shelter's northeast corner, but only two flakes were seen in the immediate vicinity.

A total of 154 pieces of chipped-stone debitage were recorded from the site (Table 3.41). Of the total debitage, 78% is quartzite, 18% is chert, 3% is hornfels/basalt, and there is one flake each of chalcedony and quartz. Of the quartzite debitage, 78% is the large size grade, while the remaining 23% is small; 53% of the debitage is noncortical and 47% has cortex; and 32% is recorded as complex flakes, 7% as shatter, and 62% as simple flakes. Of the chert debitage, 44% is the large size grade, while the remaining 56% is small; 59% of the debitage is noncortical and 41% has cortex; and 15% is recorded as complex flakes, 26% as shatter, and 59% as simple flakes.

Freehand percussion was likely the most important technique in generating both material types (Figure 3.158). The plot for quartzite and the chert is higher in terms of the percentage of small, cortical flakes than the average for all the quartzite flakes recorded in the survey. This pattern suggests that early-stage lithic reduction of quartzite generated much of the debitage.

Unfortunately, no diagnostic materials, such as projectile points or ceramics, were recovered from the site. The tool assemblage consists of 17 artifacts. Of these, 11 are non-bipolar cores, two are bifaces, two are uniface tools, one is a core-tool, and one is a drill. Material types for the cores are quartzite (8), chert (1), argillite (1), and hornfels/basalt (1). The core-tool specimen is quartzite. Of the bifaces, one specimen is broken and one is complete. The complete specimen is fine-grained quartzite and classified as finished with no visible use wear. The biface fragment is fine-grained quartzite and classified as nearly finished. Light use wear is seen on both acute lateral edges. The uniface tools are complete. The chert specimen is classified as nearly finished with light use wear on the acute left lateral edge. The fine-grained quartzite specimen is unfinished with no visible use wear. The drill is a bit fragment from a finished tool. Heavy retouch modification and light to moderate use wear is seen on the steep lateral edges.

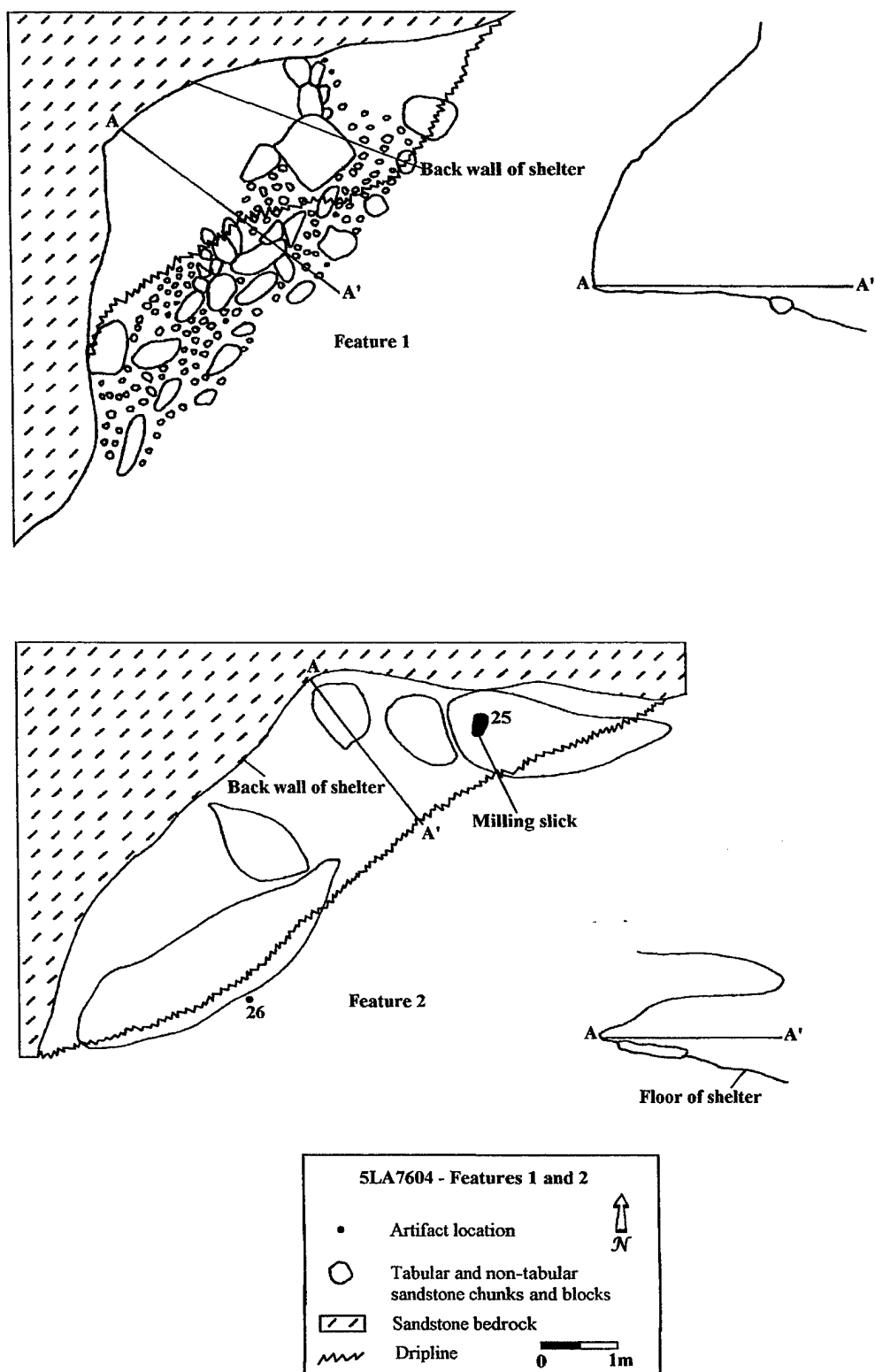


Figure 3.157: Planview and cross-section maps for Feature 1 and 2, 5LA7604.

Table 3.41: Summary Description of Chipped-Stone Debitage for 5LA7604.

	Chalcedony	Chert	Hornfels/Basalt	Quartz	Quartzite
Total flakes	1	27	5	1	120
Large	0	12	5	1	93
Small	1	15	0	0	27
Noncortical	1	16	4	1	64
Cortical	0	11	1	0	56
Bifacial-thinning	0	0	0	0	0
Bipolar	0	0	0	0	0
Complex	1	4	1	0	38
Shatter	0	7	2	0	8
Simple	0	16	1	1	74

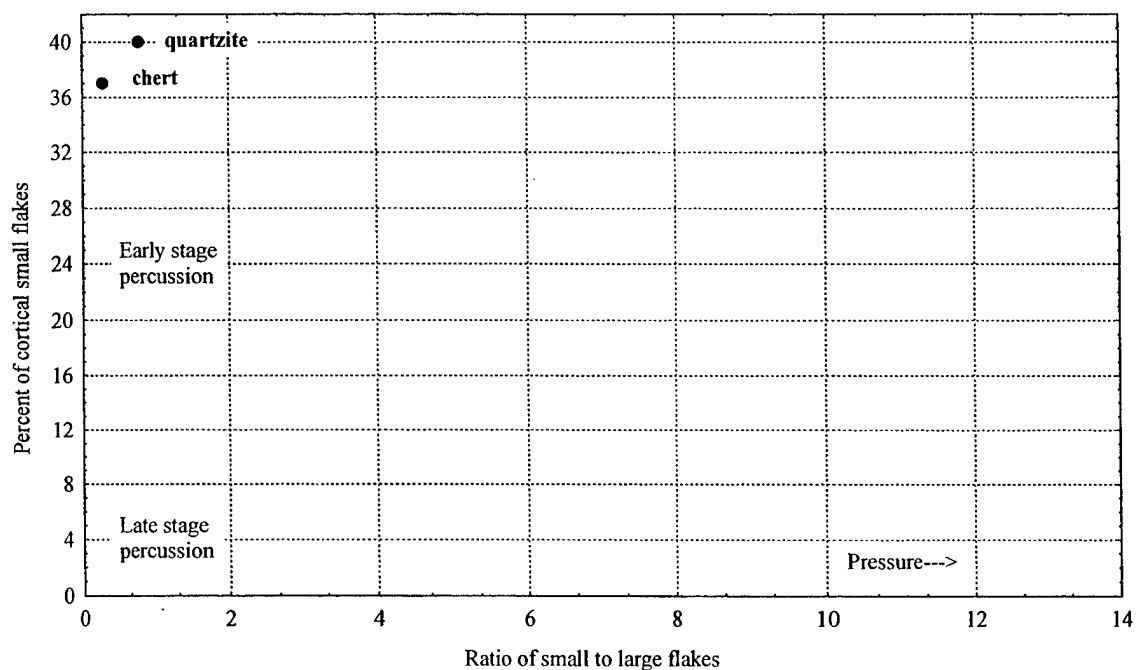


Figure 3.158: Plot of the chert and quartzite debitage from 5LA7604.

Three pieces of ground stone were recorded at the site. Two of these are manos with edge wear (FS 4 and 7), and one was a metate (FS 25). The manos are both complete, made of sandstone, and exhibit evidence of grinding and pecking. The metate is located in Feature 2 and is a flat grinding surface measuring approximately 30 x 16 cm.

Site 5LA7604 is a lithic scatter and rockshelter site (Features 1 and 2) and has a high artifact density. Unfortunately, the site exhibits rather shallow soil deposition; however, Feature 1 has approximately 30 cm and a stone enclosing wall across its opening. The presence of thermally altered rocks and ashy soil in front of the rockshelter may be a thermal feature. If so, then testing in and around this feature may yield pollen, macrobotanical, and faunal remains useful for understanding subsistence patterns. The potential of recovering carbon from test excavations is good. We recommend that the site be determined eligible for the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D).

The site is located outside the boundaries of the mechanized training area of the PCMS, and therefore is not in imminent danger from military maneuvers. If the boundary fence remains where it is (150 m due north of the site datum), we recommend no further work at the site.

Chapter IV: Revisited Sites

Five previously recorded sites were re-evaluated during the inventory of the Black Hills. These include three lithic scatters with architecture (5LA4938) recorded by Larson-Tibesar Associates (1987) and New Mexico State University (1995), 5LA6107 (Sugarloaf Spring Site) recorded by Western Cultural Resource Management (WCRM) in 1993, and 5LA6878 recorded by New Mexico State University in 1996. The remaining two sites are historic sites with previously unrecorded prehistoric components. Sites 5LA6125 and 5LA6130 were recorded in 1993 by Western Cultural Resource Management. These sites are discussed in detail in this chapter, and new information regarding changes or additions is presented.

5LA4938

During field inspection we found that the site was only recorded to the north and western border of the 1987 survey block, and it extends an additional 120 m to the north (Figure 4.1). Heavy to moderate wind and water erosion continues to expose artifacts at the surface, and these were analyzed using our lithic analysis format.

This site is a dense lithic scatter with a single stone structure (Feature 1). The site is on the top of a small mesa and extends down a west-trending finger ridge just above and east of Welsh Canyon proper. Two small dry canyons intersect the site—one at the north and one at the south side of the finger ridge. Overall, the site addition measures 120 m east to west and 177 m north to south. It has high artifact density on top of the ridge and thinly scattered lithics to the north near the bottom of the dry drainage. The site datum is at an elevation of 1,521 m (4,990 ft) asl. A roasting pit that was located during the 1987 survey could not be relocated.

Juniper, yucca, cholla, grama grass, the *Opuntias*, and rice grass were growing on the site when it was recorded. Soil deposition is relatively shallow, with some pockets of up to 22 cm recorded.

Feature 1 is a circular structure that measures approximately 3.5 m in diameter and is located about 58 m northwest of the site datum. Large bedrock boulders comprise the north and west portions of the structure, and no upright slabs were noted in the rock wall. This structure was classified by Kalasz (1989:32-40) as a Type 4, isolated enclosure.

A total of 161 pieces of chipped-stone debitage were recorded (Table 4.1). This total represents an unsystematically selected sample of the flakes on the surface when the site was recorded. Of the total debitage, 83% is quartzite, 12% is chert, and 2% is argillite. There is one flake each of chalcedony, hornfels/basalt, obsidian, and an unknown igneous rock. Of the quartzite specimens, 79% is the large size grade, while 21% is small; 53% has cortex and 47% is noncortical; and 26% is recorded as complex flakes, 6% as shatter, and 68% as simple flakes. Of the chert debitage, 50% is large and 50% is small; 25% is cortical and 75% is noncortical; and 25% is classified as complex, 25% as shatter, and 50% as simple.

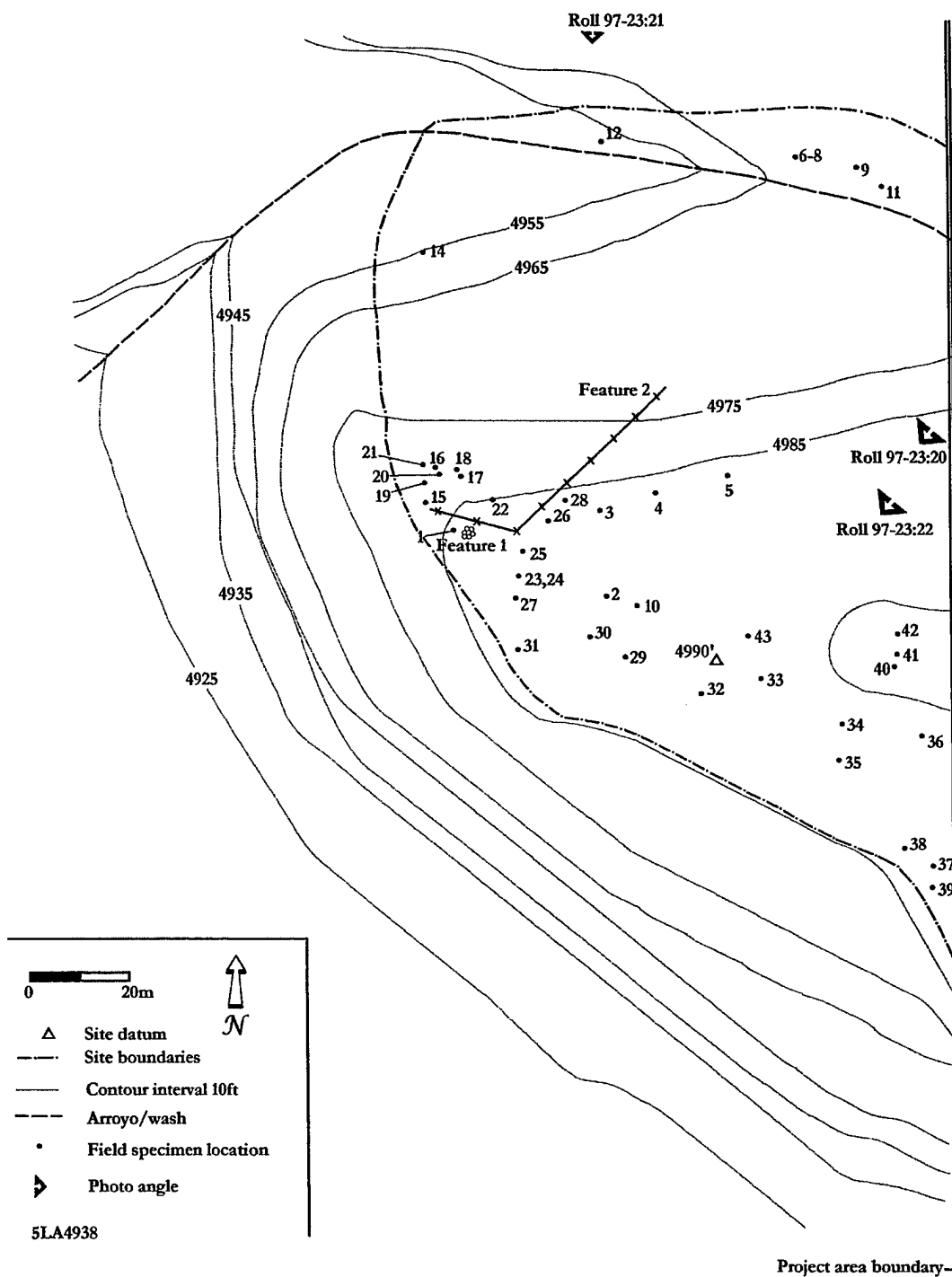


Figure 4.1: 1997 addition to the site map for 5LA4938.

Table 4.1: Summary Description of Chipped-Stone Debitage for 5LA4938.

	Argillite	Chalcedony	Chert	Hornfels/Basalt	Igneous	Obsidian	Quartzite
Total Flakes	4	1	20	1	1	1	133
Large	1	0	10	1	1	1	105
Small	3	1	10	0	0	0	28
Cortical	1	0	5	0	1	0	78
Noncortical	3	1	15	1	0	1	83
Complex	2	0	5	1	1	1	35
Shatter	0	0	5	0	0	0	7
Simple	2	1	10	0	0	0	91

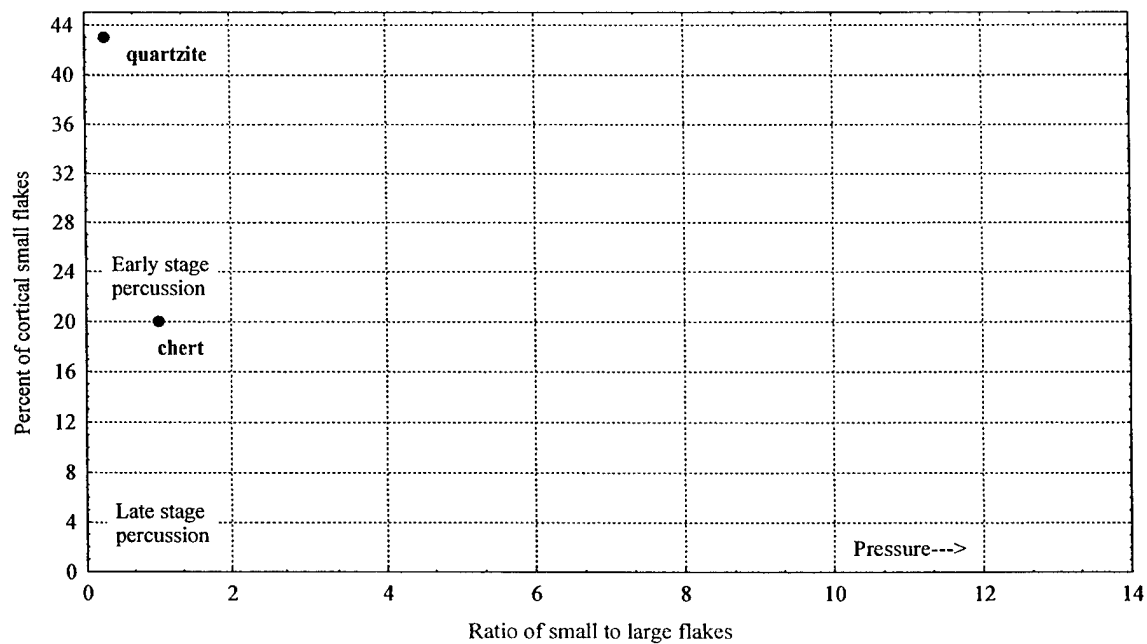


Figure 4.2: Scatter plot of quartzite and chert debitage from 5LA4938.

The quartzite debitage appears to have been generated by freehand percussion techniques (Figure 4.2). The percentage of small, cortical, quartzite flakes (9%) plots lower than the average for all sites recorded in the survey (26%) and indicates that the late stages of lithic reduction were the lithic reduction strategy most responsible for generating the quartzite debitage. This conclusion is supported by the presence of several quartzite bifaces and patterned tools. The high percentage of quartzite, cortical flakes (53%) indicates that a considerable amount of core reduction also occurred. The percent of small, cortical chert flakes plots out at 10%. This suggests that some chert tool manufacture and maintenance may have occurred at the site. Counts for the remaining material types are too low for meaningful analysis.

Five temporally diagnostic projectile points were recovered from the surface of this site. The first two points (5LA4938.0.4 and 5LA4938.0.8) are similar to Type P10. Anderson (1989:125) suggests that this style began in 5500 B.C. and continued until 3000 B.C. The third projectile point (5LA4938.0.16) is a P52 and has a probable range of A.D. 800 to A.D. 1350. The fourth point (5LA4938.0.10) is a P74 and has associated dates that range from A.D. 600 to A.D. 950. The last point (5LA4938.0.13) resembles a P83 and dates between A.D. 750 and A.D. 1650. Based on these artifacts, the site likely had an Early Archaic occupation and a Ceramic stage occupation.

The stone tools were analyzed in the field and not collected. These consist of five unfinished bifaces, four retouched flakes, and two non-bipolar cores. The bifaces are quartzite (2), chert (2), and argillite (1). Other than one chert scraper and one retouched/utilized flake, all other tools are quartzite.

Fifteen manos, seven metates, and one bedrock metate, all made of sandstone, make up the ground-stone tool assemblage. Of the manos, 12 are oval, one is rectangular, and two are irregularly shaped. Ten of the specimens are broken, and five are complete. Two of the seven metate specimens are whole, and five are more than 50% complete. These are further classified as six shallow basin and one flat metate.

This site was recommended as eligible for nomination to the National Register during the 1987 Larson-Tibesar survey. Site 5LA4938 is a lithic scatter and structure site (Feature 1) with a dense lithic scatter and numerous pieces of non-portable ground stone. Though the site has several temporally diagnostic artifacts and one intact structure, generally shallow soils provide little likelihood of encountering buried cultural deposits. Because the site is located on a high ridge, it does not appear to be in imminent danger of impact from military training.

5LA6107

During the field inspection, we learned that only the historic component and a small portion of the lithic scatter at the south and west edge of the site had been recorded. NMSU inspected this portion of the site, including the basin near the spring, but did not collect or record any data there. The extent of the lithic scatter continues an additional 230 m to the east along the top of a small north-to-south trending ridge (Figure 4.3). On the west side of the basin, the site boundary is extended another 200 meters north past the historic drift fence. We also noted the

presence of four circular or semicircular structures (these were designated Features 3, 4, 10, and 11). Additionally, four hearths (Features 6-9) and a rock alignment (Feature 5) were noted. Wind and water erosion has exposed additional artifacts, and an unsystematically selected sample of these was analyzed using our lithic analysis format.

This site is situated on a mesa top and on the slopes overlooking two small tributary canyons that serve Sugarloaf Canyon. The NMSU survey expanded the site limits to 567 m north to south and 462 meters east to west. Datum B, placed in 1997, sits at approximately 1,585 m (5,200 ft) asl. Datum A (the 1993 site datum) near the spring and corral was relocated, though no site number remains. The site elevations range from approximately 1,601 m (5,255 ft) to 1,572 m (5,160 ft).

The dominant vegetation community is juniper scrub. Piñon, mountain mahogany, yucca, *Rhus trilobata*, *Opuntia*, and various grama grasses were growing on the site at the time it was recorded. Riparian species grow near the spring. Soils are generally thin across the site, with some areas of exposed bedrock near the canyon edge. The site is in fair condition with erosion particularly noticeable along the drainages. Some intact deposits may be found near the crest of the west and east ridges.

The presence of several structures is the most distinctive site characteristic. Two structures are located directly north of Datum B (Feature 3 and 4). Feature 3 (Figure 4.4) is the best preserved of all the structures and has perhaps 20 cm (or more) of deposition. The walls are constructed of uncut sandstone slabs and measure 5.5 m in diameter. Feature 4 (Figure 4.5) is only partly preserved, with its eastern wall missing. This structure measures about 4 m in diameter and has little deposition within its walls. Features 10 and 11 (Figures 4.6 and 4.7) are located in the drainage approximately 30 m north of the spring. Feature 10 is a circular structure made up of large boulders coated with desert varnish. This feature measures 3.5 m in diameter. An ephemeral "wing wall" extends out from the structure at about a 45-degree angle. A few artifacts are present at the surface, though very little deposition remains inside the structure. Feature 11 is a possible structure as well. It is also constructed of large boulders with desert varnish.

Based on Kalasz's (1989) definitions, Features 3, and 5 are Class IV units. Similar structures have associated radiocarbon dates that extend from the Early to the Middle Ceramic stage (A.D. 200 to A.D. 1500). Feature 10 is a possible Class VI, agglutinated rock wall unit.

A total of 160 pieces of chipped-stone debitage were recorded (Table 4.2). Quartzite is the most common material with 63% of the total, 24% of the debitage is chert, 8% is argillite, 4% is hornfels/basalt, and a single flake of kaolinite, and an unidentified igneous rock was noted. Of the quartzite debitage, 76% is the large size grade and 24% is small; 34% of the flakes has cortex and 66% is noncortical; and 68% is recorded as simple flakes, 22% as complex flakes, and 10% is shatter. Of the chert flakes, 71% is large and 29% is small; 6% is cortical and 94% is noncortical; and 47% is classified as simple, 37% as complex, and 16% is shatter. The low proportions of shatter and cortical chert flakes may indicate a tendency toward the later stages of lithic reduction for chert.

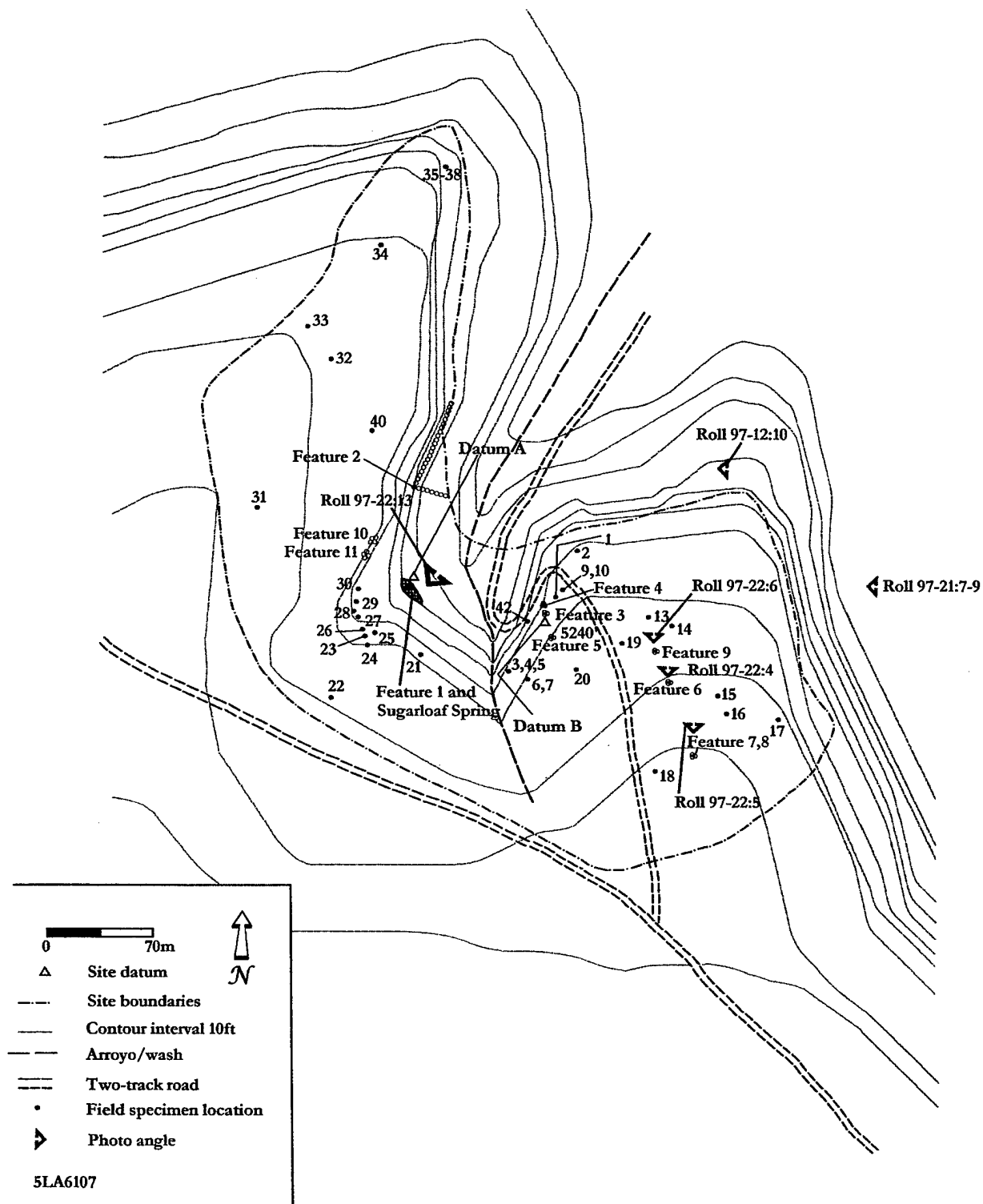


Figure 4.3: Site map, 5LA6107.

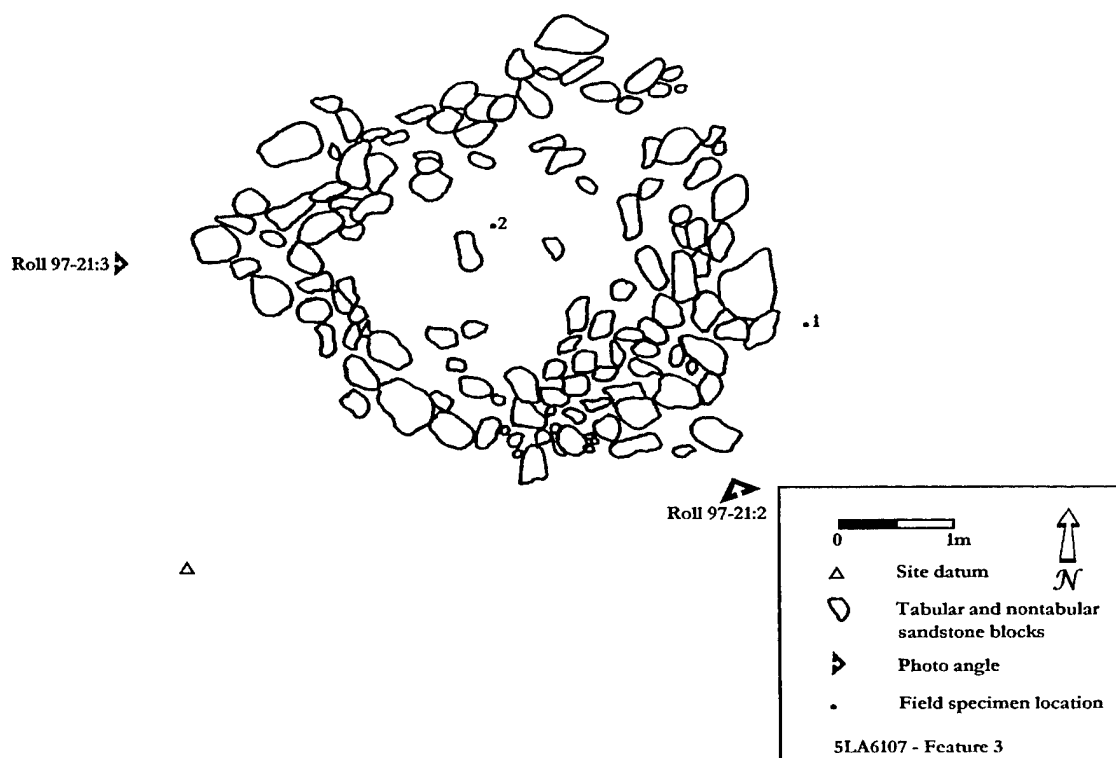


Figure 4.4: Planview of Feature 3, 5LA6107.

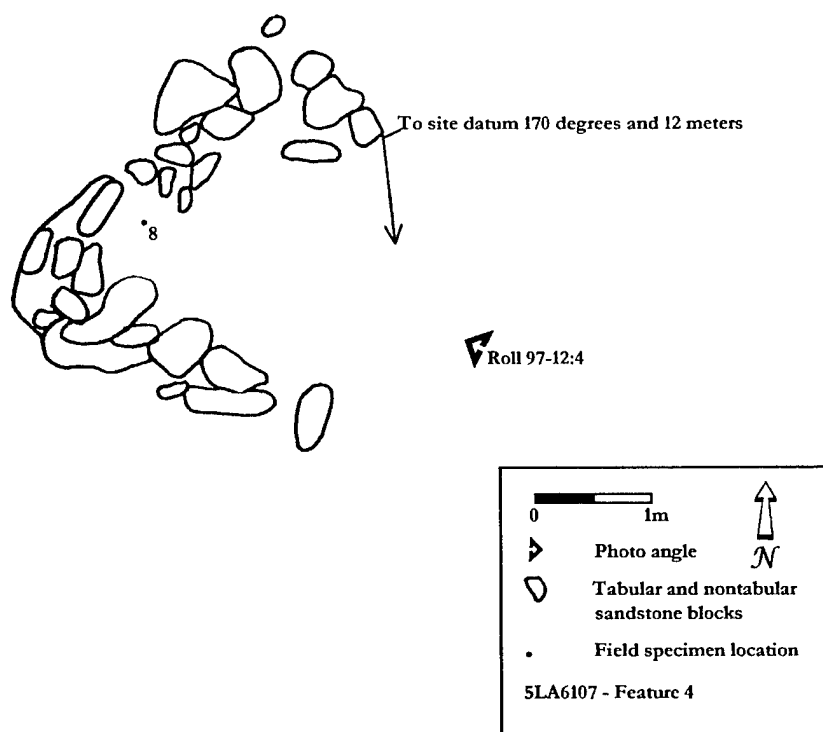


Figure 4.5: Planview of Feature 4, 5LA6107.

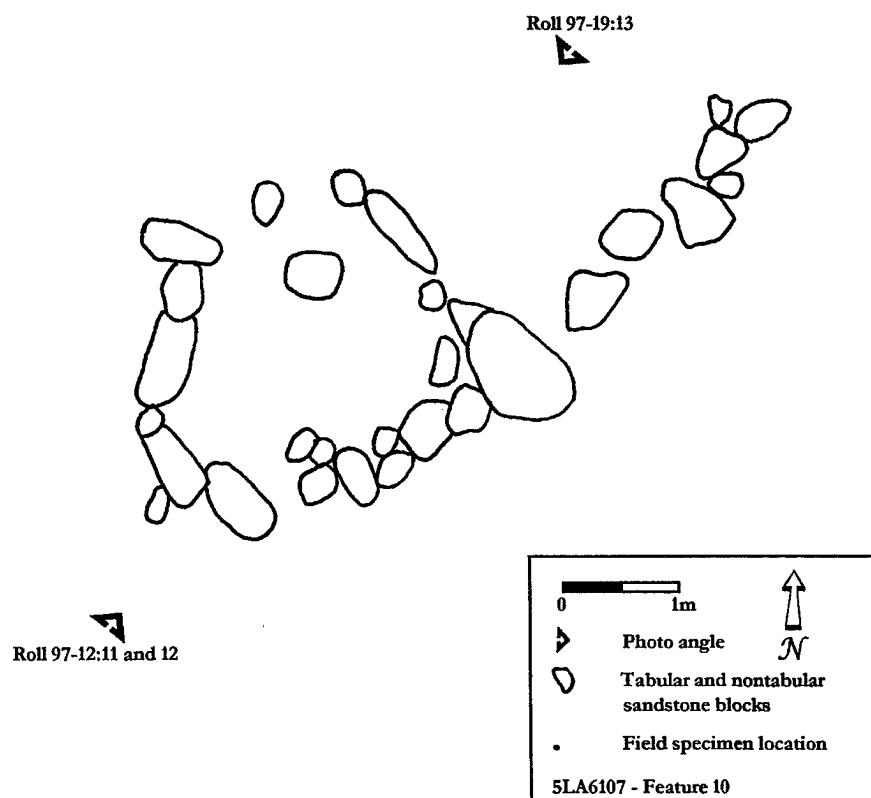


Figure 4.6: Planview of Feature 10, 5LA6107.

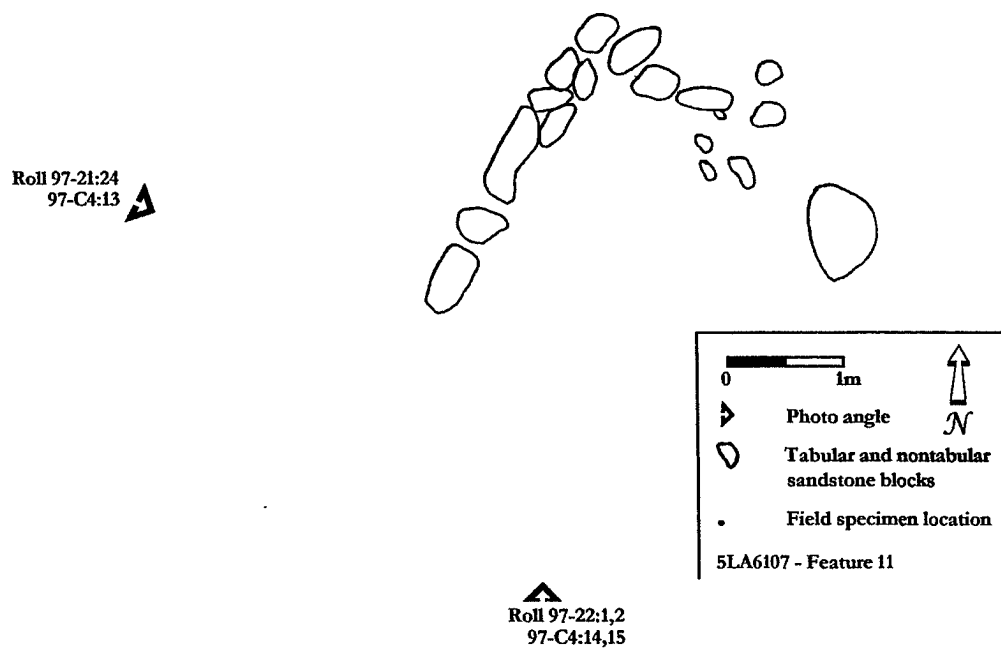


Figure 4.7: Planview of Feature 11, 5LA6107.

Table 4.2: Summary Description of Chipped-Stone Debitage for 5LA6107.

	Argillite	Chert	Hornfels/Basalt	Igneous	Kaolinite	Quartzite
Total Flakes	13	38	7	1	1	100
Large	7	11	3	1	1	76
Small	6	27	4	0	0	24
Cortical	3	2	0	0	1	34
Noncortical	10	36	7	1	0	66
Complex	3	14	1	0	0	22
Shatter	2	6	0	0	0	10
Simple	8	18	6	1	1	68

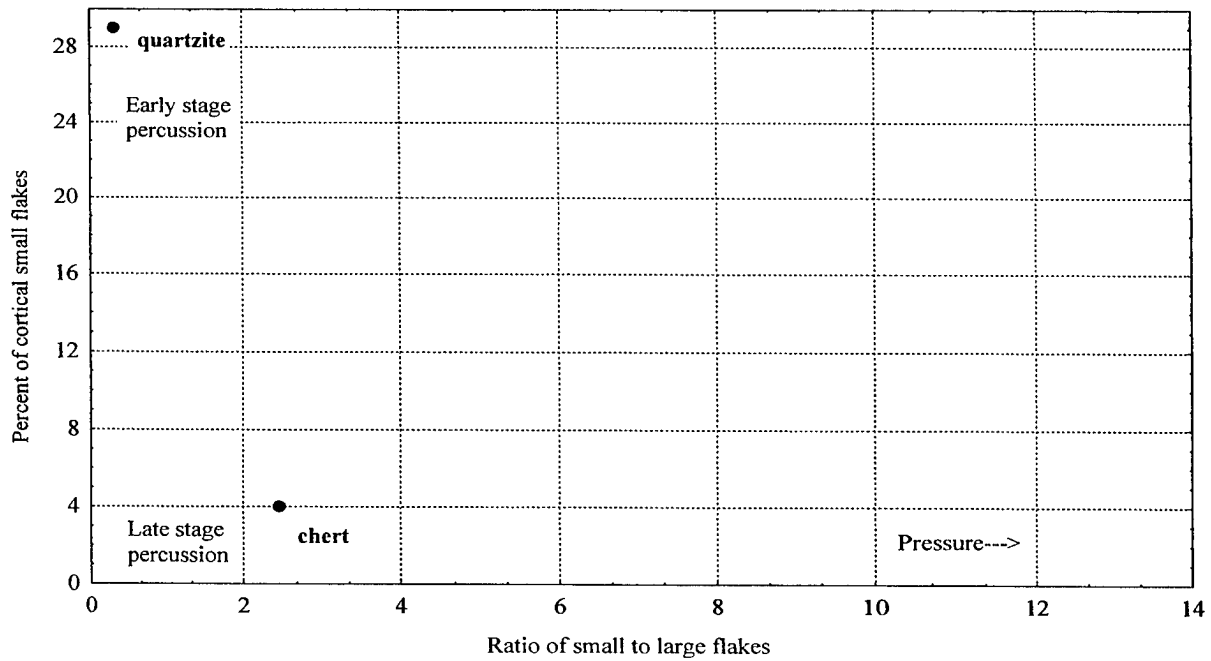


Figure 4.8: Plot of the quartzite debitage from 5LA6107.

For the most part, freehand percussion was the most important technique in generating the quartzite debitage (Figure 4.8). The relatively low percentage of cortical small flakes suggests that some quartzite later stage lithic reduction activities occurred at the site. The low percentage of chert cortical small flakes indicates that some tool manufacture and maintenance occurred at the site. The relatively high percentage of shatter suggests core reduction also occurred.

No classifiable projectile points were recorded from the site, though four large, thin, patterned bifaces and one small, thin, patterned biface were collected. These are made of quartzite (4) and chert (1). The remaining stone tools were analyzed in the field and not collected. These consist of nine unfinished bifaces, six retouched/utilized flakes, five patterned scrapers, two non-bipolar cores, and a large crude bifacial core. The bifaces are quartzite (6) and chert (3). The retouched/utilized flakes are five quartzite specimens and one chert specimen. The non-bipolar cores are quartzite, and the bifacial core-tool is hornfels/basalt.

Ground-stone artifacts include seven manos (one edge-ground) and eight metates (two bedrock). Eight metates and four manos are made of sandstone. The remaining three artifacts include a granite mano, a basalt mano, and a quartzite mano. Only the bedrock metates and the edge-ground mano were complete.

Site 56107 (Sugarloaf Spring Site) is a large lithic scatter and structure site with a historic component located at the spring. Soil deposition is noted within Feature 3, and test excavations could provide data for the reconstruction of subsistence patterns and/or paleoenvironment. The presence of ground stone indicates that plant processing was carried out in the site area. Many of the lithics were found in looters' piles, and no diagnostic artifacts were noted. The site was fenced late in the fall of 1997 to protect its contents during military maneuvers. The structure nearest the 1997 datum (Feature 3) was excavated during 1998 fieldwork activities. Test excavations revealed temporally diagnostic artifacts and thermal features that can be used to date the site, and this information can be used to contribute to our understanding of the prehistory of the Black Hills region and the PCMS. Based on this information, site 5LA6107 is eligible for the National Register of Historic Places.

5LA6125

This site has historic and prehistoric components. The historic material was previously recorded as 5LA6125. Field investigations revealed that this site was plotted in the wrong location and we re-plotted the site and added the prehistoric artifacts to the site data. A site map was drawn (Figure 4.9), all prehistoric artifacts were analyzed, and a rockshelter with evidence for prehistoric habitation was recorded.

The rockshelter (Feature 1) is located 37 degrees and 95 m from the site datum. It measures 3.5 m across its opening and 1.4 m from the dripline to the back wall. At the mouth, it measures 1.2 m from the floor to the roof (Figure 4.10). Large roof-fall blocks are scattered across the floor in no apparent pattern.

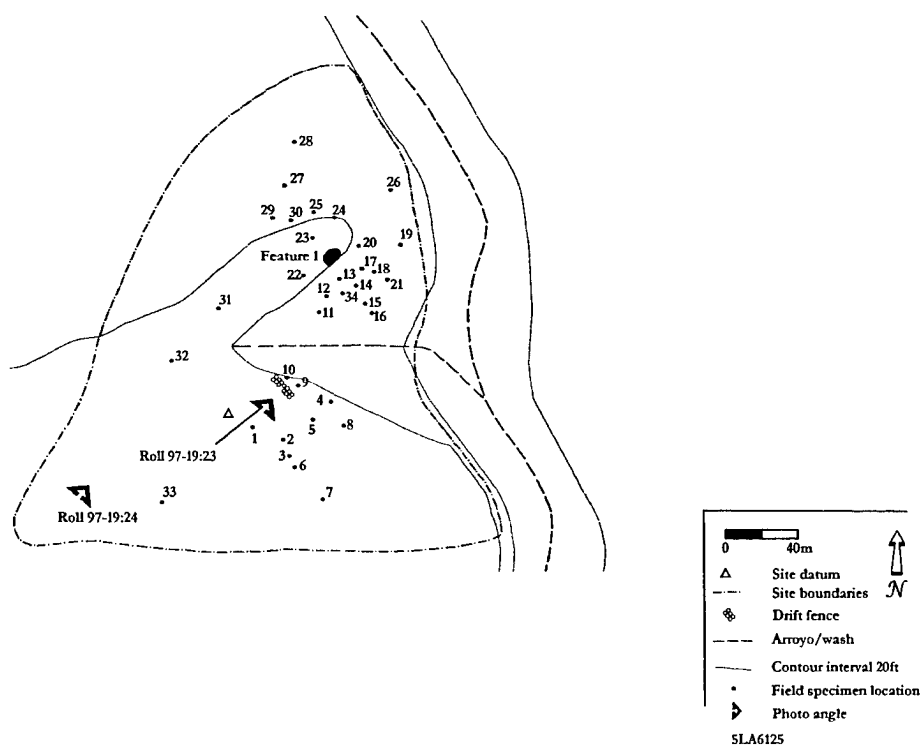


Figure 4.9: Site map, 5LA6125.

A total of 162 pieces of chipped-stone debitage were recorded from the site (Table 4.3). The majority of the materials are quartzite (58%) and chert (26%), with hornfels/basalt (11%), argillite (3%), and obsidian (2%) also represented. Two obsidian specimens were sent for source analysis and found to come from the Obsidian Ridge source in the Jemez Mountain of New Mexico (Appendix III). Of the quartzite flakes, 80% is the large size grade, while the remaining 20% is recorded as small; 55% of the flakes has cortex and 45% is noncortical; and 57% is recorded as simple flakes, 36% as complex flakes, and 6% as shatter. Of the chert flakes, 71% is large and 29% is small; 31% is cortical and 69% is noncortical; and 45% is classified as simple, 38% as complex, and 17% as shatter. The low proportions of shatter and cortical chert flakes may indicate a tendency toward the later stages of lithic reduction for chert.

Freehand percussion was likely the most important technique in generating the quartzite debitage (Figure 4.11). The relatively low percentage of cortical small flakes indicates that some quartzite later stage lithic reduction activities may have occurred at the site. The low percentage of chert cortical, small flakes suggests that some tool manufacture and maintenance occurred at the site. The relatively high percentage of shatter suggests some core reduction also occurred. Counts for the remaining material types are too low for meaningful analysis.

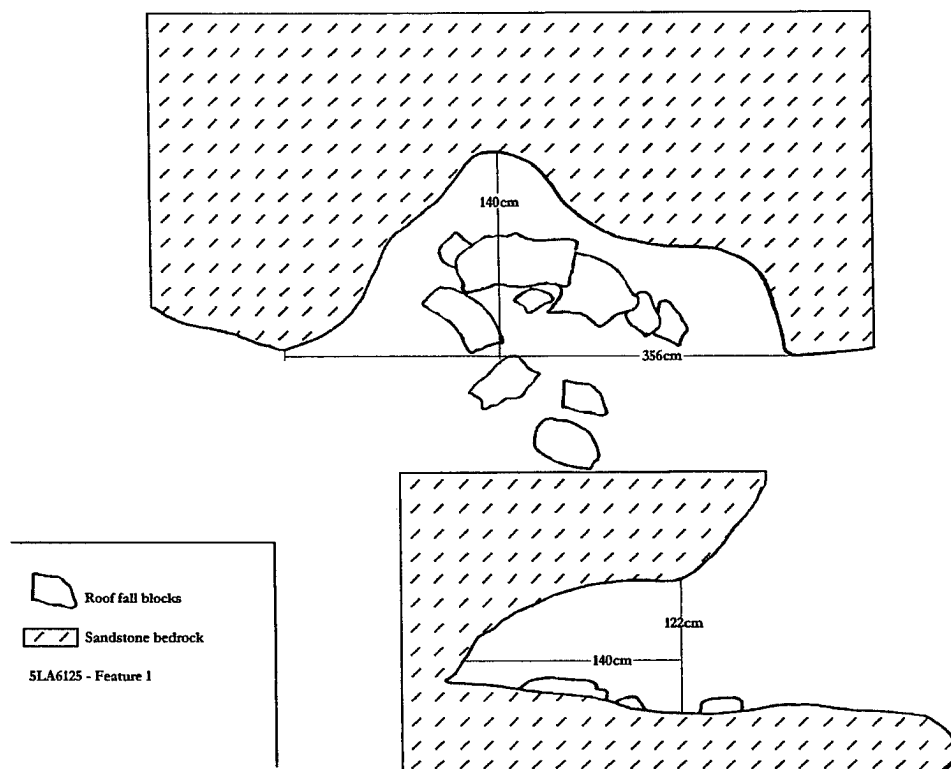


Figure 4.10: Planview and cross-section, Feature 1, 5LA6125.

Eight temporally diagnostic projectile points were recovered from the surface of this site. The first point (5LA6125.1.19) is similar to a Type P43. Anderson (1989:164-165) suggests that this style began in 3000 B.C. and continued until 500 B.C. The next two projectile points (5LA6125.0.15 and 5LA6125.0.23) are P50 types and date between A.D. 1000 to A.D. 1750. The fourth projectile point (5LA6125.0.19) is a preform categorized P49 and has a probable date range of A.D. 800 to A.D. 1750. The next two points (5LA6125.0.1 and 5LA6125.0.11) are a P58 type and have associated dates that range from between A.D. 600 and 1200. The next point (5LA6125.0.3) is classified as a P52 and dates from A.D. 800 to A.D. 1350. The last point (5LA6125.0.22) resembles a P79 and dates between A.D. 1000 and A.D. 1750. Based on these artifacts, the site likely had two occupations, one in the Middle Archaic period and one in the Middle to Late Ceramic stage.

Other than the projectile point specimens, the stone tools were analyzed in the field and not collected. These include 11 bifaces, seven non-bipolar cores, six patterned scrapers, four retouched/utilized flakes, and one core-tool. The bifaces are comprised of five quartzite specimens, four chert specimens, and two obsidian specimens. The scrapers are argillite (2), chert (2), petrified wood (1), and quartzite (1). The retouched /utilized flakes are two each for chert and quartzite. The non-bipolar cores and core-tool are made of chert (3), quartzite (3), and argillite (2). The ground-stone assemblage consists of two sandstone metate fragments and one quartzite mano fragment.

Table 4.3: Summary Description of Chipped-Stone Debitage for 5LA6125.

	Argillite	Chert	Hornfels/Basalt	Obsidian	Quartzite
Total Flakes	5	42	17	4	94
Large	5	30	12	1	75
Small	0	12	5	3	19
Cortical	3	13	1	2	52
Noncortical	2	29	16	2	42
Complex	2	16	9	1	34
Shatter	0	7	1	0	6
Simple	3	19	7	3	54

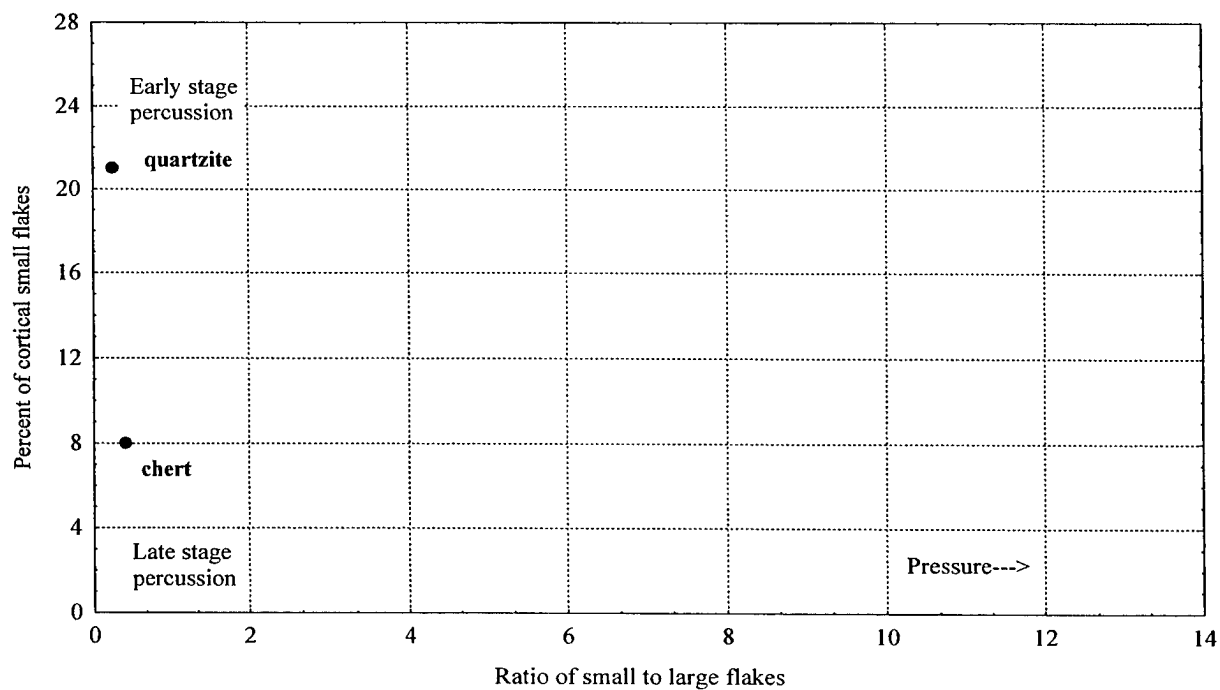


Figure 4.11: Plot of the quartzite debitage from 5LA6125.

Site 5LA6125 is a lithic scatter and rockshelter site with a high artifact density. The site exhibits rather shallow soil deposition, and Feature 1 has no intact soil deposits. The presence of obsidian indicates that the site could yield data pertinent to the reconstruction of trade and exchange networks. The site was determined not eligible in 1993 by Western Cultural Resource Management. Based on the lack of features and the low potential for subsurface deposits, we agree with this determination.

5LA6130

The site was originally recorded as a historic site. Field inspection resulted in the addition of a prehistoric component, which consists of a dispersed lithic scatter on top of a ridge that extends downslope toward the drainage to the west (Figure 4.12). The site boundary is 65 m north to south and 48 m east to west. It is based on the extent of the lithic scatter. The previous site datum was located at an elevation of 1,511 m (4,960 ft) asl. All the surface debitage was analyzed in the field using our lithic analysis format.

A total of 57 pieces of chipped-stone debitage were recorded from the site (Table 4.4). Of the total debitage specimens, 58% are quartzite, 39% are chert, and there is one piece each of basalt and chalcedony. Of the quartzite specimens, 85% falls into the large size grade, while 15% is recorded as small; 55% of the quartzite has cortex and 45% is noncortical; and 18% is recorded as complex flakes, 12% as shatter, and 40% as simple flakes. Of the chert debitage, 41% is large and 59% is small; 36% is cortical and 64% is noncortical; and 32% is classified as complex, 41% as shatter, and 27% as simple. The high shatter percentage suggests that core reduction was a dominant activity at the site.

The quartzite debitage appears to have been generated by freehand percussion techniques (Figure 4.13). The percentage of small cortical quartzite indicates that the early stages of lithic reduction were the most responsible lithic reduction strategy in creating the quartzite debitage. The low percentage of small chert, cortical flakes and the high number of shatter specimens suggest that core reduction was a dominant activity, and very little tool manufacture and maintenance took place on the site. Counts for the remaining material types are too low for meaningful analysis.

Table 4.4: Summary Description of Chipped-Stone Debitage for 5LA6130.

	Chalcedony	Chert	Hornfels/Basalt	Quartzite
Total Flakes	1	22	1	33
Large	0	9	1	28
Small	1	13	0	5
Cortical	0	8	1	18
Noncortical	1	14	0	15
Complex	1	7	1	6
Shatter	0	9	0	4
Simple	0	6	0	23

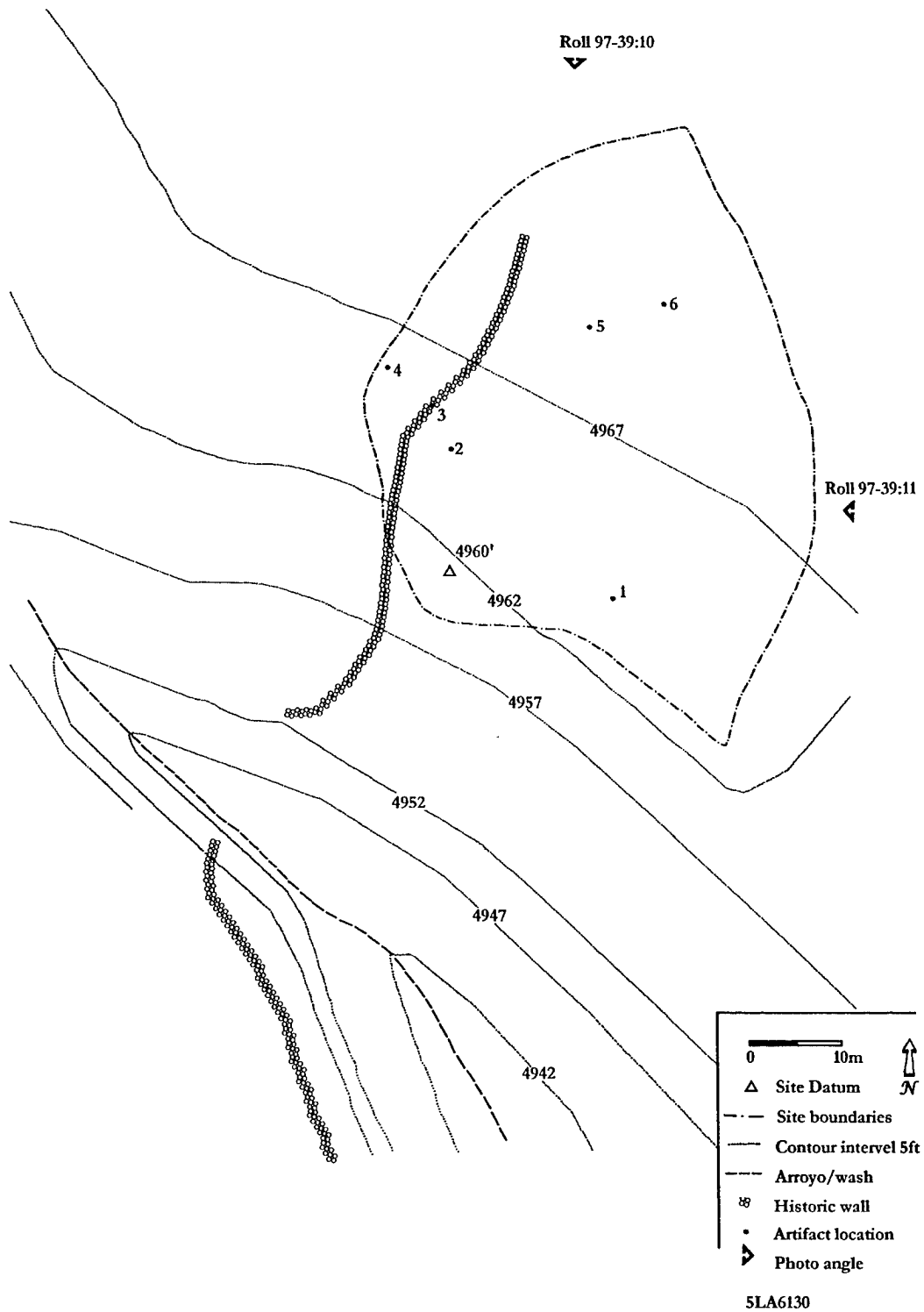


Figure 4.12: Site map, 5LA6130.

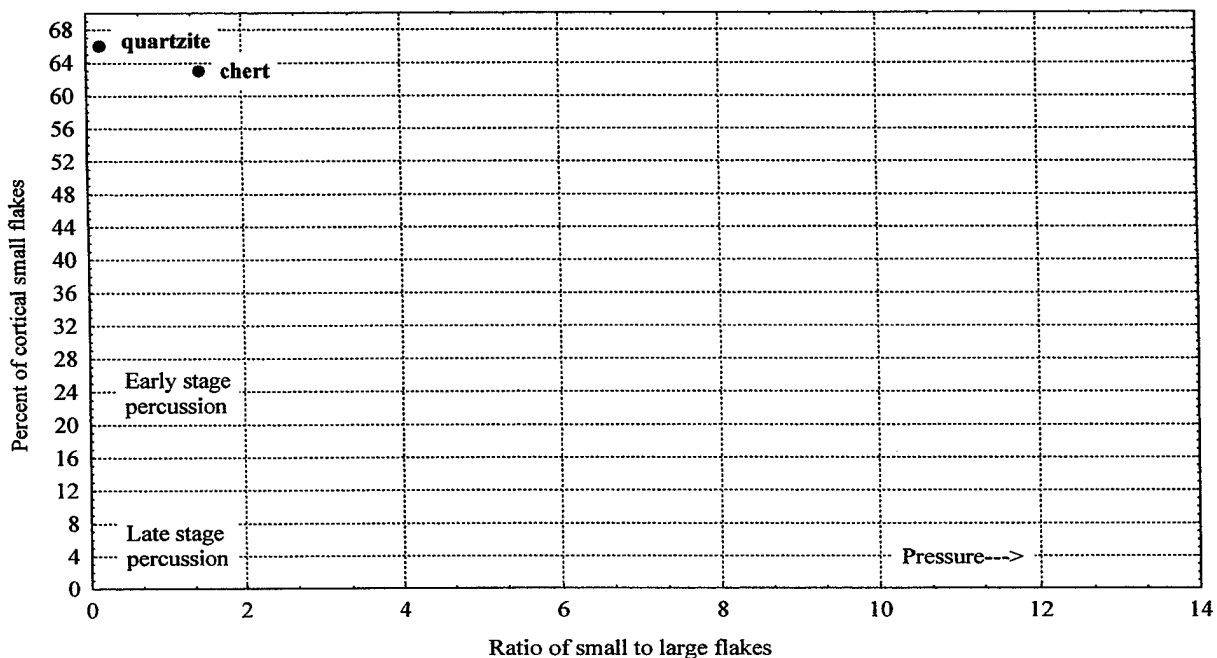


Figure 4.13: Scatter plot of the quartzite and chert debitage from 5LA6130.

Six stone tools and one sandstone mano were analyzed in the field and not collected. The tools consist of two unfinished bifaces (one chert, one hornfels/basalt), one thin, patterned, basalt biface, one quartzite scraper, one quartzite non-bipolar core, and one crude basalt biface.

The site appears stable. There are at least two sets of vehicle tracks within the site boundary and a 1-gallon gas can, so parts of the site have been impacted by military activity. The historic wall does not appear impacted. This site was determined not eligible in 1993 by Western Cultural Resource Management. Based on the lack of features and low potential for subsurface deposits, we agree with this determination.

5LA6878

This site was revisited, and a large number of previously unidentified tools (ground stone and flaked stone) and ceramics were located. Also, two structures and two ash/fire-cracked rock concentrations were identified. The site boundary was extended farther to the south based on the surface distribution of the artifacts, and a previously recorded site (5LA4968) originally to the northeast of 5LA6878 was combined with it because no separation in the artifact assemblage could be found.

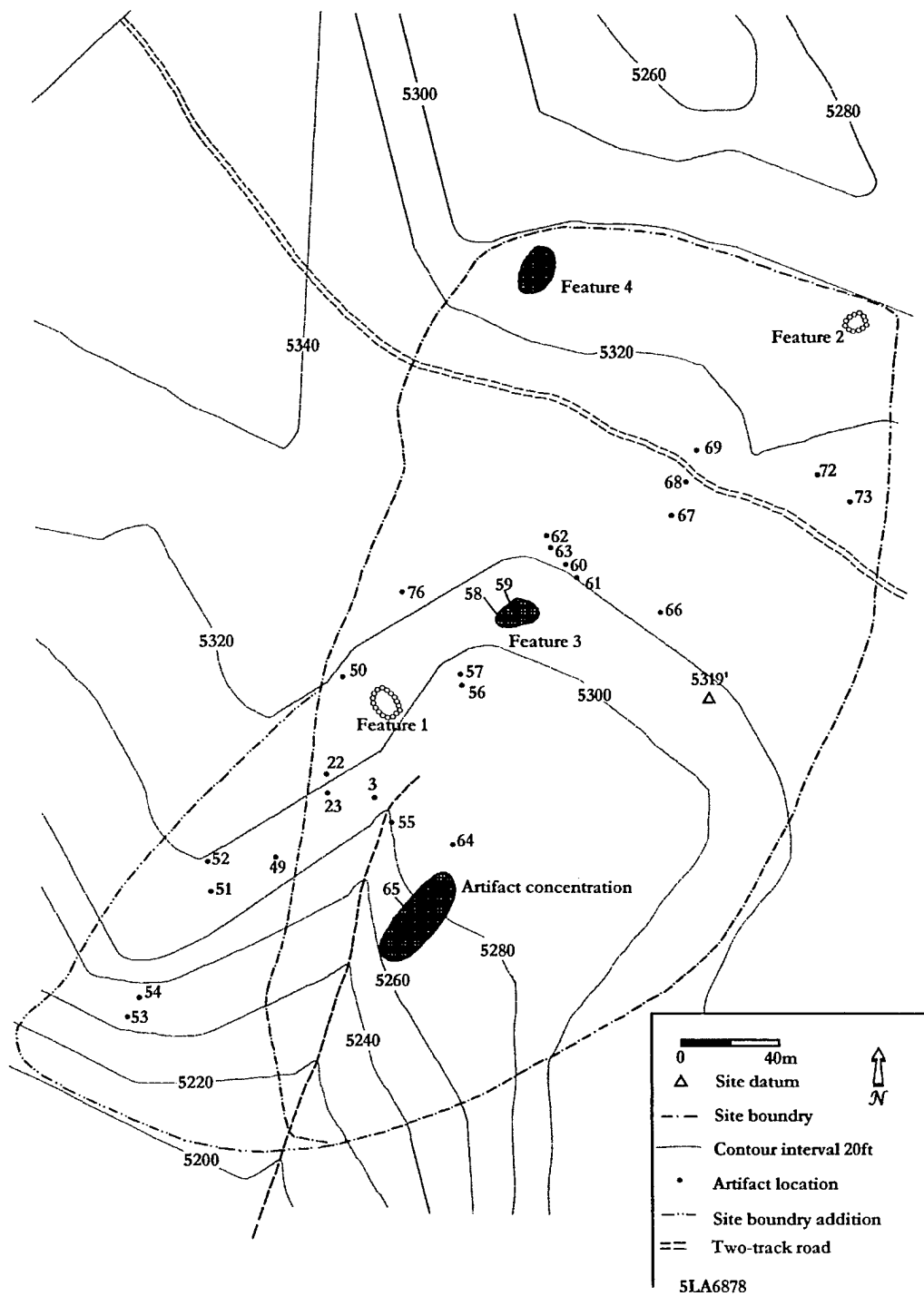


Figure 4.14: Site map, 5LA6878.

This site is located on a large finger mesa at the southern end and west edge of the Black Hills (Figure 4.14). It has a wash running southwest through the center portion of the site that drains into Welsh Canyon. The original site datum was found, and is at approximately 1,621 m (5,319 ft) asl. The vegetative community is juniper scrub.

Feature 1 is located 269 degrees and 129 m from the datum (Figure 4.15). The structure is circular, composed of unmodified slabs, and measures 7 m in diameter. An extensive scattering of artifacts was noted just outside and to the southeast of the structure. The structure exhibits some soil deposition within the walls. The second structure (Feature 2) is also circular and composed of unmodified sandstone slabs (Figure 4.17). It measures nearly 6 m in diameter and is located 26 degrees and 175 m from the datum. The two structures are Class IV, isolated units (Kalasz 1989:108). Other similar structures have associated dates that extend from the Early to the Middle Ceramic stage (A.D. 200 to A.D. 1500).

The two other features are composed of thermally altered rocks and ash. Feature 3 is located approximately 80 m and 293 degrees from the site datum. This feature measures 17 x 9 m and appears to have deposition. Feature 4 is located 190 m and 338 degrees from the site datum. The outside measurements are 20 x 14 m.

A total of 150 pieces of chipped-stone debitage were recorded from the site (Table 4.5). Of the total flakes, 87% is quartzite, 11% is chert, and 2% is hornfels/basalt. Of the quartzite flakes, 62% is the large size grade while 38% is small; 40% of the flakes are noncortical and 60% has cortex; and 14% is recorded as complex flakes, 6% as shatter, and 80% as simple flakes.

Freehand percussion was the most important technique in generating the quartzite debitage (Figure 4.18). The counts for the remaining material types were too low for meaningful analysis. The percentage of small quartzite cortical flakes is low (14%) indicating that core reduction was the major activity carried out at the site. This is also shown in the high number of cores and core-tools in the tool assemblage.

Other than the projectile points, the stone tools were analyzed in the field and not collected. Unfortunately, the two large projectile points that were collected were broken through the notches and could not be placed in the typology. The stone tools analyzed in the field include 17 non-bipolar cores, 15 patterned and unfinished bifaces, four patterned scraping tools, two bifacial core-tools, and one retouched flake. Of the cores and core-tools, 14 are quartzite and five are chert. The bifaces are made of quartzite (10), chert (3), and hornfels/basalt (2). The scrapers are two quartzite and two chert specimens. The retouched/utilized flake is chert.

Site 5LA6878 yielded a total of 28 sherds from five vessels numbered 3-7 (Figure 4.16) that are further described in Appendix II. Vessel 4 (three body, one rim sherd) is likely a cord-marked conchoidal jar with partly obliterated cord marks on exterior surfaces. Vessel 5 is an unknown type cord-marked vessel represented by one rim sherd and six body sherds. Vessel 6 (eight body sherds) is a red cord-marked vessel with a well-oxidized exterior. One rim sherd and one body sherd that are part of a conical jar represent Vessel 7. Vessel 3 is a plainware jar represented by six body sherds.

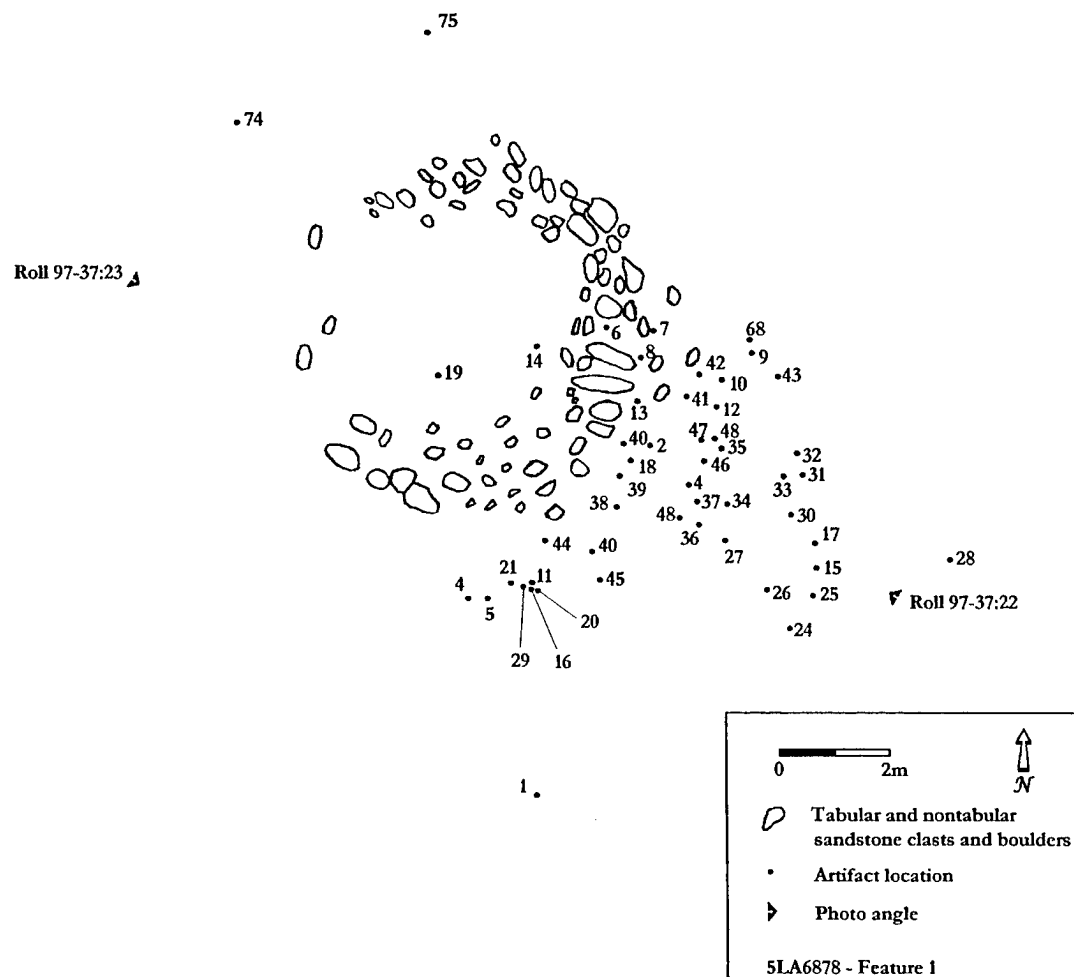


Figure 4.15: Planview, Feature 1, 5LA6878.

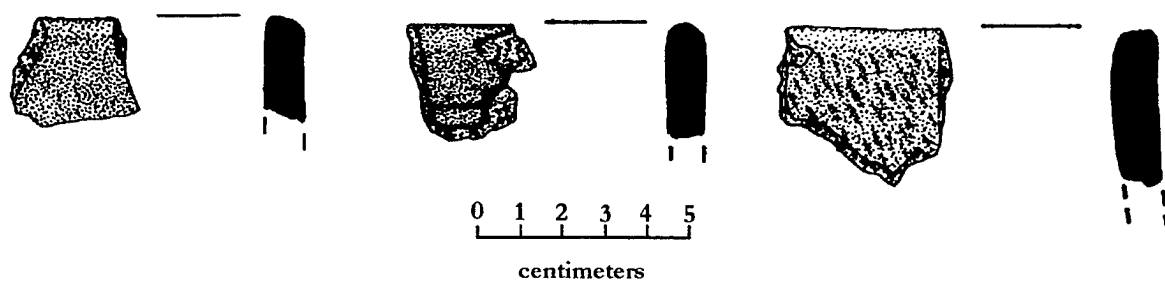


Figure 4.16: Ceramic sherds from 5LA6878. Rim sherds from Vessel 5 (5LA6878.0.25), Vessel 3 (5LA6878.0.40), and Vessel 4 (5LA6878.0.35).

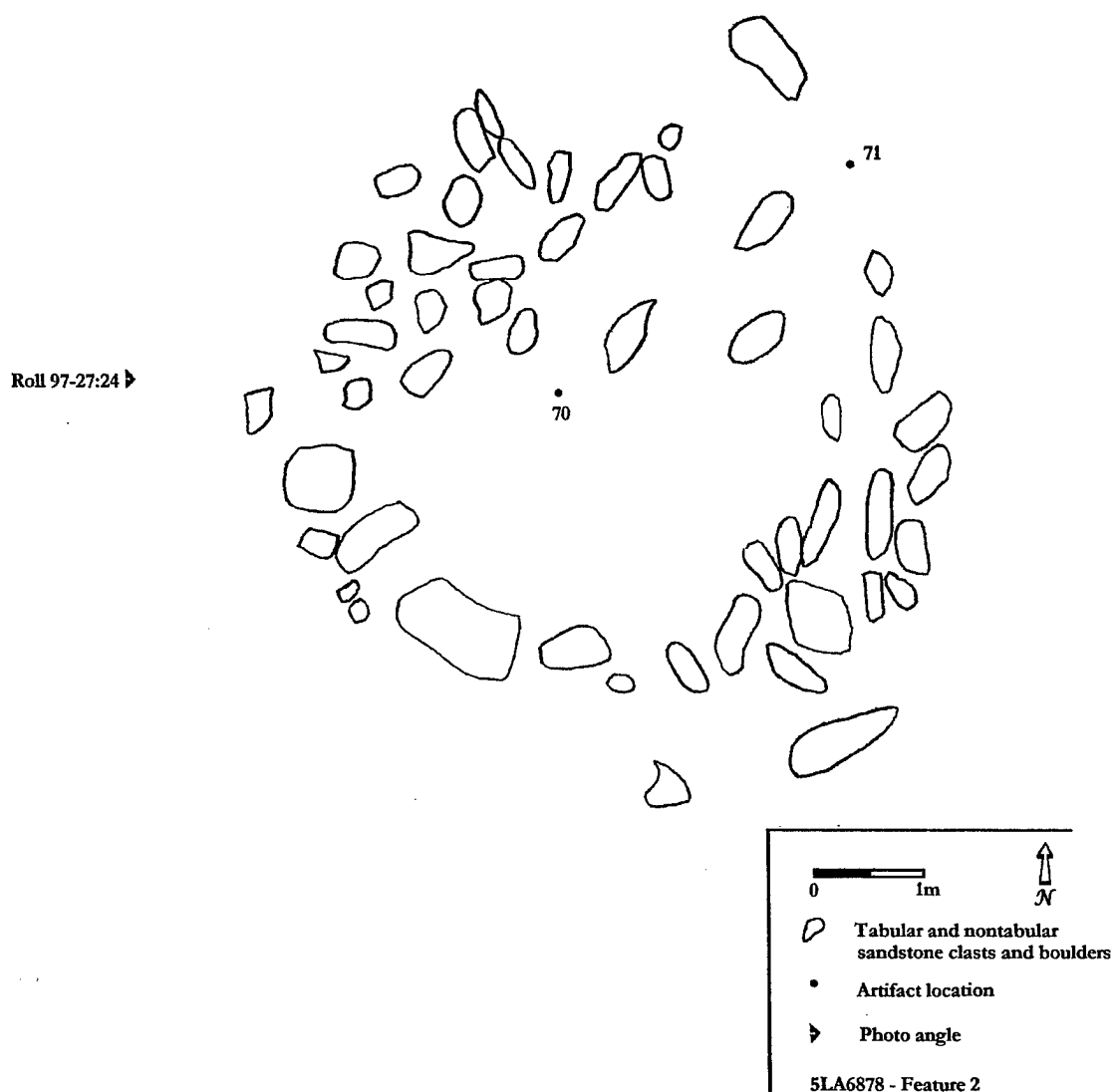


Figure 4.17: Planview, Feature 2, 5LA6878.

Table 4.5: Summary Description of Chipped-Stone Debitage for 5LA6878.

	Chert	Hornfels/Basalt	Quartzite
Total Flakes	16	4	130
Large	11	2	80
Small	5	2	50
Cortical	10	1	78
Noncortical	6	3	52
Complex	6	2	18
Shatter	3	0	8
Simple	7	2	104

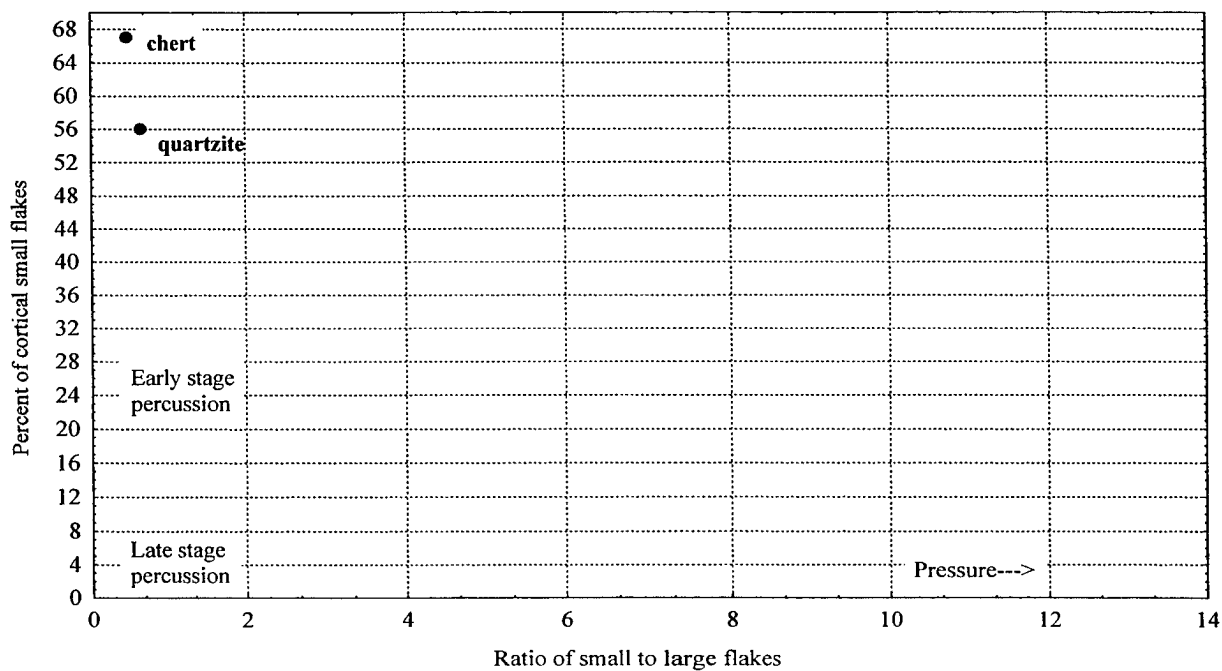


Figure 4.18: Scatter plot of quartzite and chert debitage from 5LA6878.

Seventeen pieces of ground stone were recorded at the site. All are made of sandstone. Of these, eight are manos and nine are metates. These are further classified as one-hand manos (8), flat metates (4), and shallow basin metates (5). Three of the manos and only one of the metates are whole.

Recent water erosion continues to expose numerous artifacts along the western edge of the site, suggesting that possible intact subsurface deposits are present. We recommend that the site be considered for nomination to the National Register on the grounds that it is likely to yield information important to our understanding of prehistory (Criteria D). Site 5LA6878 is a structure site with a high artifact density. Diagnostic artifacts were recovered from the surface, and it is likely that more are present in subsurface contexts. Since Features 3 and 4 appear to be roasting pits, and there is a good probability that charcoal may be recovered for radiocarbon dating. The presence of a great deal of ground stone indicates that plant processing was an important activity at the site. We suggest that the site be revisited for more detailed mapping and additional surface collection. Areas where there is a potential for intact buried deposits (especially around Features 1 and 2) should be test excavated to determine whether such deposits are present.

Chapter V: Analysis of the Collected Chipped-Stone Tools

This chapter describes retouched and/or utilized artifacts that were collected during the 1997 Black Hills survey. Projectile points and other retouched tools were comparatively common throughout much of the survey area. Nearly 900 retouched or utilized stone tools were collected during the survey. These tools are in a variety of forms that include projectile points, unifaces, drills, scrapers, large bifacially reduced knives, and expedient tools that are more difficult to classify.

Projectile point types were found that spanned the prehistoric sequence for the PCMS. Projectile points are generally not common in the region, and unfortunately these artifacts are also the primary means for assigning age estimates to sites with only surface collection data. The large assemblage of diagnostic projectile points from the Black Hills allows the examination of diachronic issues that could not otherwise be addressed using survey data.

First, raw materials identified in the assemblage are discussed. Following this discussion, the retouched or utilized artifacts other than projectile points are described. Next, the projectile point assemblage is described. Finally, patterning observed in the projectile point assemblage is discussed.

Raw Materials

The size, shape, and fracture toughness of chipped-stone raw materials constrain both the reduction techniques that can be employed and the character of the resulting artifacts (Andrefsky 1994). Consequently, it is necessary to consider raw material constraints in any lithic analysis. This section provides a brief description of the chipped-stone raw materials employed by the prehistoric inhabitants of the Black Hills.

Fracture toughness is defined as the stress-intensity factor necessary to begin the propagation of a crack in the stone (Cotterell and Kamminga 1987:678). Fracture toughness is a fundamental characteristic of chipped-stone raw materials, and although oversimplified, a meaningful dichotomy may be drawn between fine- and coarse-grained materials. Coarse-grained materials generally have much higher fracture toughness than fine-grained materials (Andrefsky 1994). Not surprisingly, prehistoric flintknappers generally appear to have employed fine-grained and coarse-grained materials for different tasks.

Because of their lower fracture toughness, fine-grained materials are well suited for thinning and shaping into patterned tool types. In contrast, the high fracture toughness of most coarse-grained materials makes them extremely difficult (if not impossible) to retouch by pressure flaking into some patterned tool types. However, high fracture toughness would have been advantageous for their use as expedient tools because the working edges would have dulled much less quickly than fine-grained materials that are more brittle. Consequently, fine-grained materials are closely associated with the production of patterned tools, whereas coarse-grained materials appear to have been more commonly used for the production of expedient flake tools.

Fine-grained raw materials identified during the Black Hills survey include chert, chalcedony, silicified wood, and obsidian. Coarse-grained materials include hornfels/basalt, quartzite, argillite, limestone, and kaolinite. This split between fine- and coarse-grained materials is oversimplified because several of these materials vary substantially in grain structure. For example, quartzite grades from fine-grained vitreous material to coarse-grained material with a sugary texture. In this investigation, the grain structure of quartzite was recorded during the retouched/utilized analysis but was not recorded as part of the projectile point analysis.

Most of the chipped-stone raw materials used by the prehistoric inhabitants of the Black Hills appear to have been available locally, but several material types were transported from somewhat greater distances. Obsidian, Alibates chert, dendritic chert, and silicified wood were all brought into the Black Hills from fairly substantial distances. Other materials such as argillite and hornfels/basalt were probably transported much shorter distances to the Black Hills.

Retouched/Utilized Tool Assemblage

The retouched/utilized tool assemblage other than projectile points includes 563 artifacts that were collected during field investigations. This section describes an analysis of these artifacts that was designed to provide descriptive data consistent with previous archaeological research on the PCMS. A single individual (Mark Owens) categorized the artifacts as one of nine types: end scraper, side scraper, end/side scraper, uniface, biface, spokeshave, drill, perforator, or utilized flake. This section provides a descriptive summary of this analysis.

Table 5.1 presents the counts of tool categories by material type. Quartzite (either fine- or coarse-grained) was the most common material type encountered in the assemblage and accounts for 32 % of the artifacts. Chert was the next most common material; 26 % of the artifacts were classified as chert. The remaining material types in the assemblage were all relatively uncommon. Argillite, silicified wood, obsidian, limestone, kaolinite, chalcedony, and hornfels/basalt all occurred at low frequencies. Quartzite and chert are the most common chipped-stone raw materials that outcrop in the Black Hills and surrounding canyons. Thus, it is unsurprising these materials are the most common in the assemblage. This observation, however, emphasizes the short distances over which the most common chipped-stone raw materials were transported and used.

Tool Types

End scrapers are defined as tools with steep-angle retouch on the distal flake margin. These artifacts were generally made from a thick flake. End scrapers were probably attached to a handle and used for scraping activities (e.g., removing flesh from animal hides). Over 90 percent of the end scrapers were made from fine-grained materials; 20 of the 22 end scrapers in the assemblage were classified as chert, fine-grained quartzite, or silicified wood. The high incidence of fine-grained materials in the end scraper assemblage may be the result of at least two factors. First, these materials generally have very sharp edges that may be well suited for

Table 5.1: Retouched/Utilized Tool Type by Material Type.

Material Type	Artifact Type										Grand Total
	Biface	Drill	End Scraper	End/Side Scraper	Perforator	Side Scraper	Spokeshave	Uniface	Utilized Flake		
Alibates	3		1	2				1		7	
Argillite	12	2	1	3				5	4	27	
Chert	56	7	14	33	3	7		16	8	144	
Dendritic Chert						1		1	1	3	
Fine-grained	78	5	4	15		4	1	31	15	153	
Quartzite											
Hornfels/Basalt	9			3				2	3	17	
Chalcedony	1	1		1				1		4	
Kaolinite								1		1	
Limestone								1		1	
Obsidian	5								2	7	
Coarse-grained	99		1	7		9		48	16	180	
Quartzite											
Silicified Wood	6	1	1	2			1	1	1	13	
Siltstone	1								5	6	
Grand Total	270	16	22	66	3	21	2	108	55	563	

scraping tough, but non-abrasive surfaces such as hides. Second, hafting a tool requires considerable additional effort. Consequently, fine-grained materials that could be more readily retouched and thus resharpened may have been preferred to coarse-grained materials that are difficult if not impossible to resharpen and must be discarded when dull.

Side scrapers are defined as artifacts with steep-angle retouch on one or more lateral margins. These artifacts may have been used in a hand-held fashion or hafted and used for scraping activities. Side scrapers occurred at almost the same incidence as end scrapers, but these artifacts may have been used for a greater variety of tasks. Almost equal numbers of fine-grained and coarse-grained side scrapers were identified in the assemblage.

End/side scrapers are defined as artifacts with steep-angle retouch on the distal and lateral flake margins. Over 60 percent of the scraping tools in the assemblage were classified as end/side scrapers. As was the case for end scrapers, most (79 percent) end/side scrapers were made from fine-grained materials. These artifacts were also probably hafted onto a handle, but the addition of lateral retouch suggests they may have been used for a wider variety of tasks than end scrapers. In many instances, this lateral retouch may simply have been done in order to facilitate hafting.

Unifaces are defined as tools with shallow-angle retouch on one face that can be on one or more margins, but only one face per margin. Unifaces were fairly common in the assemblage. A total of 107 were collected. These artifacts were made from a wide variety of materials suggesting that they were employed for many different tasks. Early-stage projectile point preforms are often difficult to distinguish from unifaces. In this analysis, flakes that lacked invasive retouch and exhibited use wear were classified as unifaces.

Bifaces are defined as artifacts with generally shallow-angle retouch on both faces and one or more margins. Bifaces were the most common artifact type; nearly half of the retouched/utilized tools were classified as bifaces. These artifacts are also sometimes difficult to distinguish from projectile point preforms. Bifaces were separated from projectile point preforms primarily based on size and/or the presence of use wear.

Spokeshaves are defined as flakes with concave retouch on one or more margins. Only two examples were identified in the assemblage. These artifacts may have been used to shape cylindrical objects such as arrow shafts. Projectile points in all manufacturing stages are present in the assemblage, suggesting that at least some arrows were made locally. Given this, the rarity of spokeshaves suggests that other tools were used to shape arrow shafts, shafts were shaped elsewhere, or shaft types such as cane that require minimal shaping were generally employed.

Drills are defined as flakes with retouch on opposing margins that forms a narrow neck. A total of 16 drills were collected. These artifacts were almost exclusively made from fine-grained materials. In order to make a drill it is necessary to extensively retouch a flake. Because of this, fine-grained materials may have been strongly preferred over coarse-grained materials. The direction of rotation was recorded for 12 of the drills (the remaining four were indeterminate). In eight cases (67 %) the rotation was clockwise when viewed from the tip down, while the remaining four were counterclockwise. This preference for right-handed

rotation may result from the handedness of the individuals who used them.

Perforators are similar to drills but are narrower and minimally retouched. Only three artifacts, all made from chert, were classified as perforators. The rarity of these artifacts suggests that they were used for specialized purposes that were not part of normal daily activities.

Utilized flakes are defined as flakes that lacked patterned flake removal, but exhibit macroscopically visible use wear. These artifacts are relatively common, with 55 examples in the assemblage. Almost 70 % of the utilized flakes were made from coarse-grained materials. This preference for coarse-grained materials may result from the high fracture toughness of these materials, which would lead to much less rapid dulling. In addition, the use of fine-grained materials for scraping or cutting, especially on hard surfaces, can result in the removal of flakes that are sometimes difficult to distinguish from intentional retouch.

Projectile Points

A total of 324 variously complete projectile points were collected. These artifacts were recovered from 135 sites or isolated finds. This section provides a descriptive summary of these artifacts. When possible, projectile points were categorized according to the system developed by Anderson (1989:111-315) for classification of projectile points from the PCMS. The primary division within this system is between large and small projectile points. The larger styles are thought to generally be atlatl dart points or thrusting spear points, whereas the small point category probably largely includes more recent arrow points.

Projectile points were found throughout the survey area, but were more common in the dissected area along the western edge of the Black Hills. The density of projectile points, however, was low at all sites and ranged between only 0 to 0.12 points per square meter.

Projectile point preforms make up nearly 40% of the point assemblage (Table 5.2). Preforms were classified as either early stage or nearly completed. It is often difficult to distinguish early-stage preforms from a variety of different artifact types including unifaces and bifacial knives. Relatively flat artifacts with shallow angle retouch that lacked usewear were classified as early-stage preforms. Early stage and nearly completed preforms comprise a somewhat smaller proportion of the large point assemblage, which may be a result of a tendency to misclassify these artifacts as bifacial knives.

Projectile points were made from a variety of different raw materials. Chert was most common (50% of the assemblage). Quartzite points were the next most common and account for 31% of the assemblage. Most of these raw materials appear to have been obtained in the immediate vicinity of the project area. Exceptions exist, however, and several exotic material types were found in the survey area. For example, a comparatively high density of obsidian artifacts was found at sites in the western portion of the survey unit (Chapter VII). Alibates and other non-local chert, as well as exotic quartzite and some types of silicified wood, also appear to have been transported to the Black Hills.

Table 5.2: Projectile Point Stage by Material Type.

Material Type	Projectile Point Stage			
	Finished	Nearly Finished	Unfinished	Total
Argillite	3			3
Hornfels/Basalt	17	4	9	30
Chalcedony	13		2	15
Chert	97	10	54	161
Obsidian	6		1	7
Silicified Wood	3	2	2	7
Quartzite	62	7	32	101
Total	201	23	100	324

Material types varied substantially for large and small points (Table 5.3). Fine-grained materials (chert, chalcedony, obsidian, and silicified wood) that are more brittle and consequently easier to retouch were used more frequently for small points, whereas materials with higher fracture toughness (quartzite, basalt, and argillite) were more common in the large point assemblage. High fracture toughness materials may have been preferred for large points for several reasons. First, these materials often occur in larger nodules than low fracture toughness materials (in part because they break less readily and natural erosion reduces them to a lesser extent). Consequently, the large blanks that are necessary for larger points could be more readily obtained using high fracture toughness materials. Second, high fracture toughness materials are stronger and less likely to break when used. Put another way, the greater difficulty in making points from high fracture toughness materials may have been offset by the greater durability of these artifacts. Third, high fracture toughness materials are more common in the PCMS than are low fracture toughness materials. Fourth, it is possible to use a billet or hard hammer when thinning large points, and these techniques are well suited for high fracture toughness materials. In contrast, it is more difficult to use either of these techniques when thinning small points, which must be done largely by pressure flaking because of their small size. This may explain the preference for low fracture toughness materials in the small point assemblage. In addition, the smaller size of arrow points and greater velocity of the arrows would have made the strength of the raw materials less of a concern.

Table 5.3: Material Type by Projectile Point Size.

Material Type	Projectile Point Size				
	Small Point	Percent	Large Point	Percent	Total
Argillite			2	100%	2
Hornfels/Basalt	3	21%	11	79%	14
Chalcedony	8	100%			8
Chert	58	66%	30	44%	88
Obsidian	3	60%	2	40%	5
Silicified Wood	1	100%			1
Quartzite	20	47%	23	53%	43
Total	92	57%	69	42%	161

In contrast to other fine-grained materials, obsidian appears to be more common in the large point assemblage. However, only five obsidian points were collected, and it is possible that this is the result of sampling error. Because obsidian was transported to the Black Hills, it is also possible that the availability of obsidian decreased through time and consequently, fewer small points were manufactured from this material. A larger sample of obsidian points is necessary to evaluate these two possibilities.

Diagnostic Projectile Points

This section summarizes metric attributes and shape characteristics for projectile points that could be categorized according to the Anderson system. Over 160 of the projectile points were assigned categories. The remaining artifacts were too fragmentary to classify. These projectile points span the prehistoric sequence for the PCMS, and suggest the Black Hills were a favored location for habitation and other activities for the last 10,000 years.

The data considered in this analysis are exclusively from surface contexts, and age estimates for the projectile points are the main way to suggest possible dates for sites. Therefore, the accuracy of the classification system is of considerable importance. Unfortunately, as with any point typology, the Anderson (1989:111-315) system has several caveats. The Anderson typology was developed to establish chronological control for the PCMS. A tacit assumption of this process is that categories in the system reflect preferences of the manufacturer, generally called mental templates, and that these mental templates changed through time.

While this assumption may hold true at some level, it does not fully account for several other processes that affect the morphology of projectile points. First and foremost, functional aspects are probably the most important determinants of point morphology. People, however, make points and it is their perception of functional characteristics that determines point morphology. Thus, this issue may appear to be semantic; however, explicit recognition of the functional determinants of point morphology may provide important insight to patterning in the point assemblage.

The Anderson typology is based on an industrial paradigm which assumes the appearance of projectile points when collected reflects the intentions of the point manufacturer. The industrial paradigm does not sufficiently incorporate the fact that breakage or use of a lithic artifact necessarily changes the appearance. Furthermore, this paradigm does not accurately consider the fact that most of what is collected is refuse. For example, the Anderson system includes point preforms as categories, and these preforms could have been intended to be a number of different finished types. Preforms make up a substantial proportion of the assemblage, and the inclusion of these artifacts as types within the system is inappropriate. Consequently, in this analysis, these types are not included when patterning in the point assemblage is considered.

The size and quality of available raw materials also plays a fundamental role in constraining lithic morphology. The project area is relatively small, however, and therefore it is unlikely that variation in raw material availability would be an important factor in variation

among the sites considered here.

The effects of breakage or reworking are more difficult to control for in any point typology. Anderson (1989:111) recognized this problem and focused on basal characteristics in response, but this approach is only a partial solution. For example, if the tangs of a point are broken through use, or when the point is being made, the style of the point would change from a greatly expanding stem to a straight or contracting stem, and this would change the category of the point in the Anderson system. While it is frequently possible to recognize this type of breakage, reworking of the base of broken points is often difficult if not impossible to recognize.

Most of the projectile points from the PCMS are from undated contexts (i.e., surface collections). Because of this, it is necessary to rely on similar styles from somewhat distant areas for which it is possible to assign age estimates. The Anderson system also does not use coherent criteria to define categories, and the assignment of artifacts to types is a highly subjective process. The large number of categories in the typology compounds this problem.

Despite these limitations, it is undeniably the case that projectile point morphology changed through time, and the Anderson classification system can be used to classify this variation in a way that provides meaningful chronological data. The source of variation in point morphology may be considered to be a moot and largely historical aspect; however, explicit recognition of functional characteristics of diachronic change in point styles can also provide meaningful insight to this data.

The following sections describe the projectile point classes in the Anderson system, and each of the different categories that are represented in the Black Hills assemblage. In order to facilitate comparisons with previous analyses, data are presented here in the same format employed by Anderson (1989). A brief summary of each point class is presented, and then the categories within the class are summarized.

Large Unstemmed Point Class

This class consists of large projectile points that lack shoulders and stems. This class of points was rare and accounts for only 5% of the classifiable projectile points. A total of nine artifacts representing three types were classified as large unstemmed points. Two of the categories in this class may be attributed to the Plano period, dating between 8500 B.C. and 5900 B.C.

Most of the artifacts in this class were assigned to Category P4, which includes teardrop shaped bifaces. Category P4 points appear to mostly be preforms for large projectile points that were discarded or lost before completion. Anderson (1989:119) suggested a broad age estimate of 5000 B.C. to A.D. 500 for this type. This long time span for manufacture is probably a reflection of the unfinished state of these artifacts.

CATEGORY P1 (Figure 5.7)

Number of Artifacts: 1 complete reworked point base

Catalogue Number: 5LA7303.0.19

Description: This artifact is possibly the reworked base of a large lanceolate projectile point. This point has a sharp tip, bi-convex cross-section, convex blade edges, no shoulders or stem, and a concave base. The base has been ground. The artifact is irregular and may not belong in Category P1. An age estimate of between 8500 B.C. and 5900 B.C. is suggested for this category (Anderson 1989:116-117).

Metric Attributes:

Length:	31.3 mm, n=1
Width:	25 mm, n=1
Greatest Thickness:	8 mm, n=1
Blade Length:	31.3 mm, n=1
Blade Width:	25 mm, n=1
Haft Width:	25 mm, n=1
Base Width:	25 mm, n=1

Material Types: Basalt (100%)

CATEGORY P3 (Figure 5.7)

Number of Artifacts: 2 total; 1 complete point, 1 point base

Catalogue Numbers: 5LA7418.0.1, 5LA7419.0.1

Description: This category includes a collaterally flaked lanceolate point base, and complete lanceolate projectile point with somewhat more irregular flaking. These points have sharp tips, bi-convex cross-sections, convex blade edges, sloping shoulders, contracting stems, pointed tangs, and slightly convex or straight bases. This category is thought to date between 7200 B.C. and 6500 B.C. (Anderson 1989:118).

Metric Attributes:

Length:	43.5 mm, n=1
Width:	22.5 – 25.3 mm, mean 23.9 mm, n=2
Greatest Thickness:	6.4 mm – 8 mm, mean 7.2 mm, n=2
Blade Length:	38 mm, n=1
Blade Width:	22.5 – 25.3 mm, mean 23.9 mm, n=2
Haft Width:	19.2 mm – 21.5 mm, mean 20.4 mm, n=2
Base Width:	15 mm – 17.2 mm, mean 16.1 mm, n=2

Material Types: Quartzite (50%), Chert (50%)

CATEGORY P4 (Figure 5.7)

Number of Artifacts: 6 total; 3 complete points, 3 point bases

Catalogue Numbers: 5LA7284.0.5, 5LA7359.0.3, 5LA7342.0.14, 5LA7341.0.11, 5LA7328.0.2, 5LA7313.0.2

Description: These large teardrop-shaped projectile points have sharp to dull tips, bi-convex or plano-convex cross-sections, convex edges, no shoulders or stems, and convex bases. This category appears to consist largely of projectile point preforms that were discarded or lost prior to completion. Anderson (1989:119) suggests an age estimate of 5000 B.C. to A.D. 500 for these artifacts.

Metric Attributes:

Length:	24.2 mm – 49.5 mm, mean 34.8 mm, n=4
Width:	18.8 mm – 27.5 mm, mean 23 mm, n=6
Greatest Thickness:	4.2 mm – 10.7 mm, mean 6.7 mm, n=6
Blade Length:	24.2 mm – 49.5 mm, mean 34.8 mm, n=4
Blade Width:	18.8 mm – 27.5 mm, mean 23 mm, n=6
Haft Width:	18.8 mm – 27.5 mm, mean 23 mm, n=6
Base Width:	18.8 mm – 27.5 mm, mean 23 mm, n=6

Material Types: Basalt (17%), Quartzite (33%), Chert (50%)

Large Straight-Stemmed Point Class

This class includes eight artifacts in four categories, and constitutes only 5% of classifiable projectile point assemblage. Projectile points in this class appear to have been first manufactured during the Early Archaic period, and may have continued to be made until A.D. 1000.

CATEGORY P6 (Figure 5.7)

Number of Artifacts: 2 point bases

Catalogue Numbers: 5LA7429.0.4, 5LA7451.0.2

Description: These projectile point bases have bi-convex cross-sections, straight blade edges, abrupt shoulders; a short, broad, straight stem; rounded tangs; and convex bases. An age estimate of 4000 B.C. to 3400 B.C. is suggested for this category (Anderson 1989:121).

Metric Attributes:

Length:	-----
Width:	25.4 – 35.7 mm, mean 30.6 mm, n=2

Greatest Thickness:	4.2 mm – 8 mm, mean 6.1 mm, n=2
Blade Length:	-----
Blade Width:	25.4 mm – 35.7 mm, mean 30.6 mm, n=2
Haft Width:	7.8 mm – 19.2 mm, mean 13.5 mm, n=2
Base Width:	6 mm – 18.3 mm, mean 12 mm, n=2

Material Types: Chert (50%), Obsidian (50%)

CATEGORY P7 (Figures 5.7, 5.8)

Number of Artifacts: 2 point bases

Catalogue Numbers: 5LA7446.0.1, 5LA7452.0.4

Description: These projectile points have biplanar or bi-convex cross-sections, straight to irregular blade edges, rounded to abrupt shoulders, straight stems, rounded tangs, and convex bases. One of the points has been heavily used, with use wear on two edges and the tip. The age estimate for this category is 3000 B.C. to 1000 B.C. (Anderson 1989:121-122).

Metric Attributes:

Length:	-----
Width:	20.2 mm – 22.3 mm, mean 20.2 mm, n=2
Greatest Thickness:	4.7 mm – 6.7 mm, mean 6.5 mm, n=2
Blade Length:	-----
Blade Width:	18 mm – 22.3 mm, mean 20.2 mm, n=2
Haft Width:	9 mm – 11.7 mm, mean 10.4 mm, n=2
Base Width:	10 mm – 11 mm, mean 10.5 mm, n=2

Material Types: Quartzite (50%), Chert (50%)

CATEGORY P8 (Figure 5.8)

Number of Artifacts: 2 point bases

Catalogue Numbers: 5LA7444.0.1, 5LA7341.0.17

Description: These large points have bi-convex cross-sections, convex blade edges, abrupt to weakly barbed shoulders, straight stems, pointed tangs, and slightly convex to straight bases. The age estimate for these projectile points is unknown (Anderson 1989:122-123).

Metric Attributes:

Length:	-----
Width:	28 mm, n=1
Greatest Thickness:	5.7 mm – 7 mm, mean 6.4 mm, n=2

Blade Length:	-----
Blade Width:	28 mm, n=1
Haft Width:	12.1 mm – 18.5 mm, mean 15.3 mm, n=2
Base Width:	12.2 mm – 18.5 mm, mean 15.6 mm, n=2

Material Types: Argillite (50%), Quartzite (50%)

CATEGORY P9 (Figure 5.8)

Number of Artifacts: 2 total; 1 complete point, 1 nearly complete point

Catalogue Numbers: 5LA7303.0.2, 5LA7351.0.5

Description: These points have sharp tips, biplanar to bi-convex cross-sections, convex blade edges, rounded shoulders, straight stems, rounded tangs, and straight bases. An age estimate of between 3300 B.C. and A.D. 1000 is suggested for this category (Anderson 1989:123-124).

Metric Attributes:

Length:	33.6 mm – 40 mm, mean 36.8 mm, n=2
Width:	16 mm – 21.1 mm, mean 18.6 mm, n=2
Greatest Thickness:	4.7 mm – 7 mm, mean 5.9 mm, n=2
Blade Length:	24 mm – 26.7 mm, mean 25.4 mm, n=2
Blade Width:	21.1 mm – 26.7 mm, mean 23.9 mm, n=2
Haft Width:	8 mm – 14.6 mm, mean 11.3 mm, n=2
Base Width:	

Material Types: Basalt (50%), Quartzite (50%)

Large Expanding-Stem Point Class

This common point class includes 45 projectile points in 16 categories. These artifacts constitute almost 30% of the classifiable projectile points. Projectile points in this class appear to have been manufactured over a long time span beginning as early as 5500 B.C. and ending as late as A.D. 1600.

CATEGORY P10 (Figure 5.8)

Number of Artifacts: 3 total; 1 nearly complete point, 2 point bases

Catalogue Numbers: 5LA4938.0.4, 5LA4938.0.8, 5LA7303.0.3

Description: These projectile points have dull tips, biplanar to bi-convex cross-sections; concave blade edges; rounded shoulders; broad, shallow, side notches; very slightly expanding to slightly

expanding stems; rounded tangs; and convex bases. Anderson (1989:125) suggests that this style began in 5500 B.C. and continued until 3000 B.C.

Metric Attributes:

Length:	40.6 mm, n=1
Width:	19.9mm – 21.5 mm, mean 20.9 mm, n=3
Greatest Thickness:	4.2 mm – 7 mm, mean 5.9 mm, n=3
Blade Length:	28.8 mm, n=1
Blade Width:	19.9 mm – 22.2 mm, mean 21.2 mm, n=3
Haft Width:	12 mm – 16.4 mm, mean 13.6 mm, n=3
Base Width:	13 mm – 20 mm, mean 15.5 mm, n=3

Material Types: Chert (33%), Quartzite (33%), Basalt (33%)

CATEGORY P16 (Figure 5.8)

Number of Artifacts: 1 complete point

Catalogue Numbers: 5LA7328.0.1

Description: This large projectile point has a sharp tip, bi-convex cross-section, straight blade edges, abrupt shoulders, a contracting flange stem, pointed tangs, and a concave base. The morphological characteristics of this point differ somewhat from those that were assigned to this category by Anderson (1989:130), and this point may be a small point style. The age estimate suggested for this style is 3000 B.C. to 200 B.C. (Anderson 1989:130-131).

Metric Attributes:

Length:	29.9 mm, n=1
Width:	17.1 mm, n=1
Greatest Thickness:	4.7 mm, n=1
Blade Length:	24 mm, n=1
Blade Width:	17.1 mm, n=1
Haft Width:	11 mm, n=1
Base Width:	14.5 mm, n=1

Material Types: Chert (100%)

CATEGORY P18 (Figure 5.8)

Number of Artifacts: 2 total; 1 nearly complete point, 1 point base

Catalogue Numbers: 5LA7429.0.3, 5LA7842.0.1 (not illustrated).

Description: These large points have dull tips, bi-convex cross-sections, convex blade edges, rounded shoulders, slightly expanding stems, rounded tangs, and indented bases. The age

estimate for this category is 3000 B.C. to 500 B.C. (Anderson 1989:132-133).

Metric Attributes:

Length:	21.4 mm, n=1
Width:	15.3 mm – 28.2 mm, mean 21.8 mm, n=2
Greatest Thickness:	4.2 mm – 4.7 mm, mean 4.4 mm, n=2
Blade Length:	16 mm, n=1
Blade Width:	15.3 mm – 28.2 mm, mean 21.8 mm, n=2
Haft Width:	11.2 mm – 13 mm, mean 12.1 mm, n=2
Base Width:	25.7 mm, n=1

Material Types: Chert (100%)

CATEGORY P20 (Figure 5.8)

Number of Artifacts: 1 point base

Catalogue Numbers: 5LA7533.0.1

Description: This point has a bi-convex cross-section, straight blade edges, barbed shoulders, pointed tangs, and a concave base. An age estimate of 500 B.C. to A.D. 1 is suggested for this category (Anderson 1989:136).

Metric Attributes:

Length:	-----
Width:	16.8 mm, n=1
Greatest Thickness:	5.1 mm, n=1
Blade Length:	-----
Blade Width:	16.8 mm, n=1
Haft Width:	8.1 mm, n=1
Base Width:	-----

Material Types: Quartzite (100%)

CATEGORY P21 (Figures 5.8, 5.9)

Number of Artifacts: 3 total; 1 complete point, 2 point bases

Catalogue Numbers: 5LA7453.0.3, 5LA7306.0.1, 5LA7416.0.1

Description: These large points have very sharp tips, bi-convex cross-sections, slightly convex blade edges, abrupt to weakly barbed shoulders, very slightly to slightly expanding stems, pointed tangs, and straight bases. An age estimate of 1000 B.C. to A.D. 750 (Anderson 1989:137-139) is suggested for this category.

Metric Attributes:

Length:	28.1 mm, n=1
Width:	18.5 mm – 22 mm, mean 22.1 mm, n=3
Greatest Thickness:	4.2 mm – 7 mm, mean 5.4 mm, n=3
Blade Length:	24.1 mm, n=1
Blade Width:	18.5 mm – 25.7 mm, mean 22.1, n=3
Haft Width:	9.1 mm – 16.2 mm, mean 12.6 mm, n=3
Base Width:	11.1 mm – 19 mm, mean 15.9, n=3

Material Types: Basalt (33%), Quartzite (33%), Obsidian (33%)

CATEGORY P22 (Figure 5.9)

Number of Artifacts: 1 point base

Catalogue Numbers: 5LA7409.0.2

Description: This point base has a bi-convex cross-section, very weakly barbed shoulders, slightly expanding stem, pointed tangs, and very slightly concave base. An age estimate of 1500 B.C. to A.D. 500 is suggested for this category (Anderson 1989:139-140).

Metric Attributes:

Length:	----
Width:	----
Greatest Thickness:	4.6 mm, n=1
Blade Length:	----
Blade Width:	----
Haft Width:	17.1 mm, n=1
Base Width:	19.9 mm, n=1

Material Types: Chert (100%)

CATEGORY P25 (Figure 5.9)

Number of Artifacts: 2 point bases

Catalogue Numbers: 5LA7400.0.9, 5LA7400.0.13

Description: These two point bases were found at the same site and are very similar to each other. The points in this category have bi-convex or plano-convex cross-sections, straight blade edges, abrupt shoulders, expanding stems, rounded tangs, and convex bases. These projectile points are thought to date between 1500 B.C. and 1000 B.C. (Anderson 1989:142).

Metric Attributes:

Length:	-----
Width:	16.3 mm – 16.4 mm, mean 16.4 mm, n=2
Greatest Thickness:	5.0 mm – 5.3 mm, mean 5.2 mm, n=2
Blade Length:	-----
Blade Width:	16.3 mm – 16.4 mm, mean 16.4 mm, n=2
Haft Width:	10.1 mm – 12 mm, mean 11.1 mm, n=2
Base Width:	12.6 mm – 14.6 mm, mean 13.6 mm, n=2

Material Types: Chert (100%).

CATEGORY P26 (Figures 5.9, 5.10)

Number of Artifacts: 8 total; 6 point bases, 1 complete point, and 1 nearly complete point

Catalogue Numbers: 5LA7303.0.1, 5LA7304.0.2, 5LA7354.0.1, 5LA7452.0.7, 5LA7420.0.1, 5LA7522.0.1, 5LA7581.0.6, 5LA7596.0.1

Description: Points in this category have sharp tips, straight blade edges, largely bi-convex cross-sections, barbed shoulders, rounded or pointed tangs, and slightly convex bases. These points are thought to date between 1000 B.C. and A.D. 500 (Anderson 1989:143).

Metric Attributes:

Length:	40.4 mm, n=1
Width:	19.7 mm – 28.4 mm, mean 24.6, n=7
Greatest Thickness:	3.6 mm – 5.7 mm, mean 4.8 mm, n=8
Blade Length:	30 mm, n=1
Blade Width:	19.7 mm – 28.4 mm, mean 24.6 mm, n=7
Haft Width:	8.5 mm – 19.3 mm, mean 13.7 mm, n=8
Base Width:	9 mm – 23.5 mm, mean 17.4 mm, n=6

Material Types: Chert (50%), Quartzite (50%)

CATEGORY P27 (Figure 5.10)

Number of Artifacts: 5 point bases

Catalogue Numbers: 5LA7282.0.15, 5LA7341.0.4, 5LA7347.0.2, 5LA7453.0.6, 5LA7351.0.6

Description: These point bases have bi-convex cross-sections, straight blade edges, barbed shoulders, expanding stems, pointed tangs, and straight or convex bases. An age estimate of between 500 B.C. and A.D. 1000 is suggested for this category (Anderson 1989:144).

Metric Attributes:

Length:	-----
Width:	28.2 mm – 38.5 mm, mean 32.1 mm, n=5
Greatest Thickness:	5.1 mm – 9.1 mm, mean 6.9 mm, n=5
Blade Length:	-----
Blade Width:	18.2 mm – 38.5 mm, mean 29.9 mm, n=5
Haft Width:	15 mm – 18.2 mm, mean 16.7 mm, n=5
Base Width:	20.2 mm – 23 mm, mean 21.2, n=3

Material Types: Chert (20%), Quartzite (80%)

CATEGORY P28 (Figure 5.10)

Number of Artifacts: 2 projectile point bases

Catalogue Numbers: 5LA7414.0.3, 5LA7569.0.1

Description: These point bases have bi-convex cross-sections, straight blade edges, barbed shoulders, slightly expanding stems, and straight bases. Anderson (1989:145) suggests that this category dates between 2000 B.C. and A.D. 1000.

Metric Attributes:

Length:	-----
Width:	18.4 mm – 23.5 mm, mean 21 mm, n=2
Greatest Thickness:	3.8 mm – 6 mm, mean 4.9 mm, n=2
Blade Length:	-----
Blade Width:	18.4 mm – 23.5 mm, mean 21 mm, n=2
Haft Width:	13.1 mm – 14.5 mm, mean 13.8 mm, n=2
Base Width:	15.7 mm – 16 mm, mean 15.9 mm, n=2

Material Types: Basalt (50%), Quartzite (50%)

CATEGORY P29 (Figure 5.10)

Number of Artifacts: 1 nearly complete point

Catalogue Numbers: 5LA7331.0.2

Description: This nearly complete point has a dull tip, bi-convex cross-section, I-E recurve blade edge, abrupt shoulders, an expanding stem, rounded tangs, and a convex base. An age estimate of 500 B.C. to A.D. 600 is suggested for this category (Anderson 1989:146).

Metric Attributes:

Length:	20 mm, n=1
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Width:	19.3 mm, n=1
Greatest Thickness:	5 mm, n=1
Blade Length:	14 mm, n=1
Blade Width:	19.3 mm, n=1
Haft Width:	10 mm, n=1
Base Width:	-----

Material Types: Chert (100%)

CATEGORY P30 (Figure 5.10)

Number of Artifacts: 2 total, 1 nearly complete point, 1 point base

Catalogue Numbers: 5LA7356.0.2, 5LA7772.0.1

Description: These points have sharp tips, bi-convex cross-sections, straight blade edges, weakly barbed shoulders, expanding stems, and straight bases. This category is thought to date between 1000 B.C. and A.D. 1000 (Anderson 1989:147-148).

Metric Attributes:

Length:	25.3 mm – 28mm, mean 26.7 mm, n=2
Width:	20.6 mm – 22.3 mm, mean 21.4 mm, n=2
Greatest Thickness:	3.8 mm – 4.4 mm, mean 4.1 mm, n=2
Blade Length:	21.6 mm – 22 mm, mean 21.8 mm, n=2
Blade Width:	20.6 mm – 22 mm, mean 21.3 mm, n=2
Haft Width:	10.4 mm – 12.6 mm, mean 11.5 mm, n=2
Base Width:	15 mm, n=1

Material Types: Chert (100%)

CATEGORY P32 (Figure 5.10)

Number of Artifacts: 1 projectile point base

Catalogue Numbers: 5LA7556.0.1

Description: This point base has a bi-convex cross-section, straight blade edges, weakly barbed shoulders, a slightly expanding stem, rounded tangs, and a straight base. An age estimate of 500 B.C. to A.D. 1000 is suggested for this category (Anderson 1989:151-152).

Metric Attributes:

Length:	-----
Width:	22.7 mm, n=1
Greatest Thickness:	5.5 mm, n=1

Blade Length: -----
Blade Width: 22.7 mm, n=1
Haft Width: 12 mm, n=1
Base Width: 14.4 mm, n=1

Material Types: Chert (100%)

CATEGORY P35 (Figure 5.11)

Number of Artifacts: 7 total; 2 point bases, 3 complete points, and 2 nearly complete points

Catalogue Numbers: 5LA7265.0.2, 5LA7273.0.9, 5LA7277.0.6, 5LA7357.0.13, 5LA7430.0.1, 5LA7424.0.1, 5LA7774.0.1

Description: These large points have sharp tips, bi-convex cross-sections, straight or convex blade edges, abrupt shoulders, broad expanding stems, round or pointed tangs, and slightly convex bases. This category is thought to date between 1000 B.C. and A.D. 1200 (Anderson 1989:154-155).

Metric Attributes:

Length: 21.2 mm – 30 mm, mean 25.6 mm, n=5
Width: 16.2 mm – 21.9 mm, mean 19.2 mm, n=6
Greatest Thickness: 4.1 mm – 5.5 mm, mean 4.6 mm, n=7
Blade Length: 15.7 mm – 22.6 mm, mean 19.5 mm, n=5
Blade Width: 16.2 mm – 21.9 mm, mean 19.2 mm, n=6
Haft Width: 11.3 mm – 15.9 mm, mean 13.0 mm, n=6
Base Width: 13.1 mm – 16.8 mm, mean 14.9 mm, n=4

Material Types: Chert (71%), Quartzite (29%)

CATEGORY P37 (Figure 5.11)

Number of Artifacts: 1 nearly complete point

Catalogue Number: 5LA7265.0.1

Description: This point has a sharp tip, bi-convex cross-section, straight blade edges, weakly barbed shoulders, a slightly expanding stem, pointed tangs, and a slightly convex base. An age estimate of A.D. 850 to A.D. 1100 is suggested for this category (Anderson 1989:157).

Metric Attributes:

Length: 33 mm, n=1
Width: 21 mm, n=1
Greatest Thickness: 4.5 mm, n=1

Blade Length:	25 mm, n=1
Blade Width:	21 mm, n=1
Haft Width:	8.8 mm, n=1
Base Width:	13.4 mm, n=1

Material Types: Basalt (100%)

CATEGORY P42 (Figures 5.11, 5.12)

Number of Artifacts: 5 total; 4 nearly complete points, 1 complete point

Catalogue Numbers: 5LA7310.0.1, 5LA7348.0.1, 5LA7403.0.5, 5LA7493.0.3, 5LA7507.0.5

Description: These points have sharp or very sharp tips, bi-convex cross-sections, straight to slightly convex blade edges, weakly barbed to barbed shoulders, expanding stems, rounded or pointed tangs, and slightly convex or straight bases. Anderson (1989:161-162) suggests an age estimate of 1500 B.C. to 1000 B.C. for these points.

Metric Attributes:

Length:	21.1 mm – 36.1 mm, mean 28.7 mm, n=4
Width:	16.1 mm – 19.4 mm, mean 17.6 mm, n=5
Greatest Thickness:	3.8 mm – 5.8 mm, mean 4.8 mm, n=5
Blade Length:	16.5 mm – 28.8 mm, mean 23.6 mm, n=5
Blade Width:	16.1 mm – 19.4 mm, mean 17.6 mm, n=5
Haft Width:	6.4 mm – 11 mm, mean 8.2 mm, n=5
Base Width:	8.8 mm – 15.3 mm, mean 11.1 mm, n=3

Material Types: Basalt (40%), Chert (40%), Quartzite (20%)

Large Contracting-Stem Point Class

Only a single projectile point was assigned to this class, which constitutes just 0.6% of the classifiable points. This artifact has been reworked, and it is possible that other points in this class also represent reworked forms, which could in part account for their rarity. These projectile points appear to be very rare throughout the PCMS; the large assemblage examined by Anderson (1989:164) included only four examples or 0.8% of the total.

CATEGORY P43 (Figure 5.12)

Number of Artifacts: 1 point base

Catalogue Number: 5LA6125.0.19

Description: The tip and base of this point have been reworked. Both corners of the base appear

to have broken and to have been reworked into a contracting stem. The tip is dull and appears to have been used for scraping. The artifact has a bi-convex cross-section, straight blade edges, abrupt shoulders, a contracting stem, rounded tangs, and a straight base. Anderson (1989:164-165) suggests that this category dates between 3000 B.C. to 500 B.C., however this point has been reworked, and it appears to have originally been a different style.

Metric Attributes:

Length:	-----
Width:	22.6 mm, n=1
Greatest Thickness:	5.1 mm, n=1
Blade Length:	-----
Blade Width:	22.6 mm, n=1
Haft Width:	12.1 mm, n=1
Base Width:	8.9 mm, n=1

Material Types: Quartzite (100%)

Large Flange-Stemmed Point Class

Only five of the classifiable projectile points were assigned to this class, which includes only 3% of the points. Two of the three categories represented in this class have only a single example. These points are similar to small point styles where flange-stemmed points are substantially more common. The age estimates for points in this class range between 6000 B.C. and A.D. 1000 (Anderson 1989).

CATEGORY P45 (Figure 5.12)

Number of Artifacts: 3 total; 1 nearly complete point, 2 point bases

Catalogue Numbers: 5LA7278.0.1, 5LA7320.0.4, 5LA7359.0.1

Description: This category is the most common in the class of large flange-stemmed points, but has only 3 examples. These points have dull tips and bi-convex cross-sections, blade edges are straight or slightly convex, shoulders are abrupt, the points have straight flange stems and one point has a slightly contracting flange stem, tangs are pointed, and the bases are indented. An age estimate of 3000 B.C. to 300 B.C. is suggested for this category (Anderson 1989:167).

Metric Attributes:

Length:	21.6 mm, n=1
Width:	16.6 mm – 18 mm, mean 17.4 mm, n=3
Greatest Thickness:	3.5 mm – 5 mm, mean 4.1 mm, n=3
Blade Length:	12.2 mm, n=1
Blade Width:	15.3 mm – 18 mm, mean 16.6 mm, n=3
Haft Width:	8.7 mm – 13 mm, mean 10.7 mm, n=3
Base Width:	17.6 mm, n=1

Material Types: Chert (33%), Basalt (33%), Quartzite (33%)

CATEGORY P46 (Figure 5.12)

Number of Artifacts: 1 point base

Catalogue Number: 5LA7461.0.1

Description: The single point base in this category is heavily patinated and has a bi-convex cross-section, straight blade edges, abrupt shoulders, a straight stem, rounded tangs, and a very slightly concave base.

Metric Attributes:

Length:	-----
Width:	17.5 mm, n=1
Greatest Thickness:	5.4 mm, n=1
Blade Length:	-----
Blade Width:	16.4 mm, n=1
Haft Width:	11.3 mm, n=1
Base Width:	17.5 mm, n=1

Material Types: Argillite (100%)

CATEGORY P47 (Figure 5.12)

Number of Artifacts: 1 complete point

Catalogue Number: 5LA7342.0.8

Description: This point has light patination, a sharp tip, a plano-convex cross-section, convex blade edges, sloping shoulders, a flange stem, rounded tangs, and a concave base. An age estimate of 3300 B.C. to A.D. 1000 is suggested for this style (Anderson 1989:168-169).

Metric Attributes:

Length:	18.3 mm, n=1
Width:	13.7 mm, n=1
Greatest Thickness:	4.4 mm, n=1
Blade Length:	9.4 mm, n=1
Blade Width:	11.6 mm, n=1
Haft Width:	10 mm, n=1
Base Width:	13.7 mm, n=1

Material Types: Basalt (100%)

Small Unstemmed Point Class

A total of 19 artifacts were categorized as small unstemmed points. These artifacts comprise 12% of the classifiable point assemblage. Only two of the four categories in this class are represented. Most of the artifacts in this class appear to be unfinished projectile points that were discarded or lost prior to completion. Only mid- to late-stage point preforms were assigned to this class; this total does not include all small point preforms in the assemblage. Although it is also possible that some of these artifacts were used to tip projectiles, artifacts in this class are thicker on average than other small point styles (Figure 5.1) and they frequently have step fractures or other aspects that preclude further thinning. Both of these observations support the suggestion that these artifacts are generally mid- to late-stage preforms for small projectile points.

The two categories represented in the Black Hills assemblage have age estimates that encompass much of the time period during which small projectile points were manufactured. This is unsurprising given that these artifacts are probably uncompleted points, and most of the stylistic characteristics that distinguish different point categories consist of aspects that are not completed until the final stages of manufacture. For example, the position of notches is crucial to determining point style, and notching is generally one of the final steps when making a point. Basal characteristics are also important for determining the point type. Basal thinning and shaping is done during the final stages, because removing flakes from the base creates ridges that are perpendicular to the lateral margins of the point. Thus it is necessary to thin the lateral margins before the base because flakes removed from the lateral margins will generally terminate at perpendicular ridges.

CATEGORY P49 (Figures 5.12, 5.13)

Number of Artifacts: 15 total; 6 point bases, 6 complete points, 3 nearly complete points

Catalogue Numbers: 5LA6125.0.14, 5LA7317.0.2, 5LA7277.0.3, 5LA7351.0.8, 5LA7421.0.14, 5LA7438.0.3, 5LA7438.0.8, 5LA7443.0.4, 5LA7518.0.1, 5LA7518.0.3, 5LA7518.0.5, 5LA7538.0.17, 5LA7581.0.1, 5LA7600.0.9, 5LA7600.0.30

Description: These small teardrop-shaped points exhibit considerable morphological variability, which probably reflects their unfinished character. This category was also one of the most common in the assemblage, which is probably a result of the fact that these preforms could have been made into any of number of different point styles. They generally have sharp tips but two examples have very sharp tips, cross-sections are bi-convex or plano-convex or concavo-convex, blade edges are straight or irregular or convex, the points lack stems or shoulders, bases are convex or straight, and a single example has a slightly concave base. Anderson (1989:174-175) suggests that these points were made between A.D. 800 and A.D. 1750, but may date as early as 200 B.C. This long period of manufacture may be a result of the fact that these points do not appear to be finished, and may have been intended to be any of several small point styles.

Metric Attributes:

Length:	15.7 mm – 31.8 mm, mean 20.8 mm, n=7
Width:	10 mm – 18.8 mm, mean 13.7 mm, n=14
Greatest Thickness:	2.6 mm – 5.4 mm, mean 3.5 mm, n=14
Blade Length:	15.7 mm – 31.8 mm, mean 20.8 mm, n=7
Blade Width:	10 mm – 18.8 mm, mean 13.7 mm, n=14
Haft Width:	10 mm – 18.8 mm, mean 13.7 mm, n=14
Base Width:	10 mm – 18.8 mm, mean 13.7 mm, n=14

Material Types: Chert (86.7%), Basalt (6.6%), Petrified wood (6.6%)

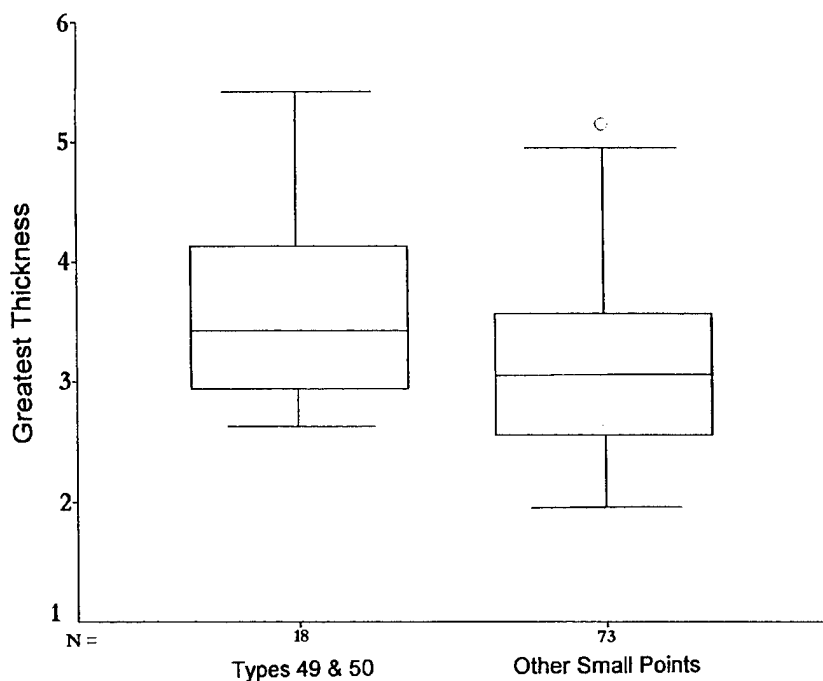


Figure 5.1: Boxplots showing thickness of preforms and small typed projectile points.

CATEGORY P50 (Figure 5.13)

Number of Artifacts: 4 total; 1 complete point, 3 point bases

Catalogue Numbers: 5LA6125.0.15, 5LA6125.0.23, 5LA7498.0.4, 5LA7538.0.4

Description: These points have sharp tips, bi-convex or plano-convex cross-sections, irregular blade edges or straight blade edges, no stems or shoulders, pointed or rounded tangs (n=1), and

they all have concave bases. Anderson (1989:175-176) suggests an age estimate of A.D. 1000 to A.D. 1750 for this class.

Metric Attributes:

Length:	18.1 mm, n=1
Width:	13.8 mm – 16.9 mm, mean 15.5 mm, n=4
Greatest Thickness:	2.8 mm – 5.2 mm, mean 3.9 mm, n=4
Blade Length:	18.1 mm, n=1
Blade Width:	13.8 mm – 16.9 mm, mean 15.5 mm, n=4
Haft Width:	13.8 mm – 16.9 mm, mean 15.5 mm, n=4
Base Width:	13.8 mm – 16.9 mm, mean 15.5 mm, n=4

Material Types: Chert (100%)

Small Straight-Stemmed Point Class

A total of 10 artifacts in three categories were assigned to this class. These artifacts constitute just 6% of the classifiable point assemblage. This class appears to include an unusually high proportion of chalcedony points, and only a single quartzite point is present. Projectile points in this class appear to have been manufactured between A.D. 700 and A.D. 1400 (Anderson 1989).

CATEGORY P52 (Figure 5.13)

Number of Artifacts: 4 total; 2 point bases, 2 nearly complete points

Catalogue Numbers: 5LA4938.0.16, 5LA6125.0.3, 5LA6626.0.1, 5LA7600.0.33

Description: These points have very sharp tips, bi-convex or plano-convex cross-sections, convex or straight blade edges, rounded or abrupt or weakly barbed shoulders, rounded or pointed tangs, and convex or straight or concave bases.

Metric Attributes:

Length:	20 mm – 20.8 mm, mean 20.4 mm, n=2
Width:	9.8 mm – 13 mm, mean 10.9 mm, n=4
Greatest Thickness:	2.4 mm – 4.2 mm, mean 3 mm, n=4
Blade Length:	16 mm – 17.9 mm, mean 17 mm, n=2
Blade Width:	6.3 mm – 8.1 mm, mean 7.2 mm, n=2
Haft Width:	9.8 mm – 13 mm, mean 10.9 mm, n=4
Base Width:	5.5 mm – 7 mm, mean 5.9 mm, n=4

Material Types: Chalcedony (50%), Chert (50%)

CATEGORY P53 (Figures 5.13, 5.14)

Number of Artifacts: 3 total; 1 point base, 1 nearly complete point, 1 complete point

Catalogue Numbers: 5LA7323.0.5, 5LA7430.0.3, 5LA7548.0.3

Description: These projectile points have sharp tips, bi-convex or plano-convex cross-sections, straight blade edges, weakly barbed or barbed shoulders, straight stems, rounded tangs, and convex bases.

Metric Attributes:

Length:	17 mm – 25 mm, mean 21 mm, n=2
Width:	11.1 mm – 17.3 mm, mean 14.7 mm, n=3
Greatest Thickness:	3.1 mm – 4.9 mm, mean 3.7 mm, n=3
Blade Length:	13.4 mm – 21.2 mm, mean 17.3 mm, n=2
Blade Width:	11.1 mm – 17.3 mm, mean 14.7 mm, n=3
Haft Width:	6.3 mm – 9.9 mm, mean 7.8 mm, n=3
Base Width:	7.6 mm – 10.3 mm, mean 8.9 mm, n=2

Material Types: Chert (66%), Quartzite (33%)

CATEGORY P54 (Figure 5.14)

Number of Artifacts: 3 total; 2 complete points, 1 point base

Catalogue Numbers: 5LA7353.0.3, 5LA7419.0.7, 5LA7512.0.3

Description: These projectile points have very sharp tips, bi-convex to plano-convex cross-sections, straight to slightly convex blade edges, abrupt to weakly barbed shoulders, straight stems, pointed tangs, and straight to slightly convex bases. An age estimate of A.D. 750 to A.D. 1400 is suggested for this point type (Anderson 1989:180-181).

Metric Attributes:

Length:	15.2 mm – 16 mm, mean 15.6 mm, n=2
Width:	9.7 mm – 11.1 mm, mean 10.4 mm, n=3
Greatest Thickness:	2.4 mm – 3.4 mm, mean 2.9 mm, n=3
Blade Length:	11.7 mm – 11.8 mm, mean 11.8 mm, n=2
Blade Width:	9.7 mm – 11.1 mm, mean 10.4 mm, n=3
Haft Width:	3.8 mm – 4 mm, mean 4 mm, n=3
Base Width:	4.9 mm – 6.2 mm, mean 5.4 mm, n=3

Material Types: Chert (67%), Chalcedony (33%)

Small Expanding-Stem Point Class

This class includes small corner-notched projectile points. A total of 30 artifacts in 10 different categories were assigned to this class, which comprises 19% of the classifiable projectile points. Artifacts in this class appear to have been manufactured for a long period of time, and they may date from the end of the Late Archaic period to the Historic period.

CATEGORY P56 (Figure 5.14)

Number of Artifacts: 1 complete projectile point

Catalogue Number: 5LA7553.0.1

Description: This artifact has use wear on both edges and the tip, which has altered the appearance. It appears to have been used as a drill. This point is near the upper end of the size range for small points, and is possibly a large point style. The point has a plano-convex cross-section, concave blade edges, rounded shoulders, a slightly expanding stem, pointed tangs, and a slightly convex base. Anderson (1989:183) suggests an age estimate of A.D. 750 to A.D. 1100 for this category.

Metric Attributes:

Length:	24.7 mm, n=1
Width:	18.3 mm, n=1
Greatest Thickness:	5.1 mm, n=1
Blade Length:	18 mm, n=1
Blade Width:	18.3 mm, n=1
Haft Width:	11.1 mm, n=1
Base Width:	13.9 mm, n=1

Material Types: Quartzite (100%)

CATEGORY P58 (Figure 5.14)

Number of Artifacts: 8 total; 2 point bases, 4 nearly complete points, and 2 complete points

Catalogue Numbers: 5LA6125.0.3, 5LA6125.0.11, 5LA7351.0.2, 5LA7403.0.2, 5LA7509.0.7, 5LA7471.0.2, 5LA7538.0.18, and 5LA7548.0.6

Description: This category was relatively common and comprises 5% of the assemblage. One of these projectile points (5LA7474.0.2) may be a large point style, but appears to be a poorly made (the point is twisted and curved) preform that would have been smaller if finished. These projectile points have very sharp tips, most have bi-convex cross-sections but two examples have plano-convex cross-sections, blade edges are straight or convex, shoulders are weakly barbed to barbed, stems are slightly expanding or expanding, and the bases are straight or slightly convex.

An age estimate of A.D. 600 to A.D. 1200 is suggested for this category (Anderson 1989:184-187).

Metric Attributes:

Length:	21.6 mm – 30.2 mm, mean 23.7 mm, n=6
Width:	10 mm – 16.3 mm, mean 14.3 mm, n=8
Greatest Thickness:	2.6 mm – 4.4 mm, mean 3.3 mm, n=8
Blade Length:	14.4 mm – 19.5 mm, mean 18.7 mm, n=6
Blade Width:	10 mm – 16.3 mm, mean 14.5 mm, n=8
Haft Width:	5.4 mm – 13.7 mm, mean 7.7 mm, n=8
Base Width:	6.9 mm – 16.4 mm, mean 10.6 mm, n=5

Material Types: Chert (63%), Quartzite (25%), Chalcedony (12%)

CATEGORY P59 (Figures 5.14, 5.15)

Number of Artifacts: 6 total; 2 point bases, 2 nearly complete points, and 2 complete points

Catalogue Numbers: 5LA7357.0.2, 5LA7416.0.3, 5LA7420.0.5, 5LA7512.0.2, 5LA7538.0.24, 5LA7538.0.25

Description: These projectile points have sharp or dull tips, bi-convex or plano-convex cross-sections, straight blade edges, abrupt or weakly barbed shoulders, very slightly expanding stems to expanding stems, pointed or rounded tangs, and straight bases. Anderson (1989:188-190) suggests an age estimate of A.D. 500 to A.D. 1200 for these points.

Metric Attributes:

Length:	21.5 mm – 27.2 mm, mean 24.8 mm, n=4
Width:	11.7 mm – 18.4 mm, mean 14.4 mm, n=6
Greatest Thickness:	2.4 mm – 3.7 mm, mean 3.3 mm, n=7
Blade Length:	17.1 mm – 23.4 mm, mean 20.4 mm, n=4
Blade Width:	11.7 mm – 18.4 mm, mean 14.4 mm, n=7
Haft Width:	4.2 mm – 9.3 mm, mean 6.9 mm, n=7
Base Width:	5.5 mm – 10.1 mm, mean 8.6 mm, n=3

Material Types: Chert (71%), Quartzite (29%)

CATEGORY P61 (Figure 5.15)

Number of Artifacts: 1 point base

Catalogue Number: 5LA7274.0.5

Description: This projectile point has a missing tip, a bi-convex cross-section, the blade edges

are straight, the shoulders are abrupt, the stem is expanding, the tangs are pointed, and the base is straight. These projectile points are thought to date between A.D. 270 and A.D. 1400 (Anderson 1989:192-193).

Metric Attributes:

Length:	-----
Width:	-----
Greatest Thickness:	2.0 mm, n=1
Blade Length:	-----
Blade Width:	-----
Haft Width:	9.2 mm, n=1
Base Width:	7.8 mm, n=1

Material Types: Obsidian (100%)

CATEGORY P62 (Figure 5.15)

Number of Artifacts: 8 total; 6 nearly complete points, and 2 complete points

Catalogue Numbers: 5LA7283.0.2, 5LA7311.0.4, 5LA7342.0.7, 5LA7365.0.5, 5LA7466.0.2, 5LA7572.0.1, 5LA7572.0.2, 5LA7554.0.2

Description: These projectile points have very sharp or sharp tips, five examples have plano-convex cross-sections and three examples have bi-convex cross-sections, blade edges are straight or slightly convex, shoulders are barbed to extended barbed, stems are slightly expanding to greatly expanding, tangs are pointed or rounded, and the bases are slightly convex. These projectile points are thought to date between A.D. 500 and A.D. 1400 (Anderson 1989:193-196).

Metric Attributes:

Length:	14.5 mm – 21.3 mm, mean 17.9 mm, n=6
Width:	11.2 mm – 13.6 mm, mean 12.6 mm, n=7
Greatest Thickness:	2.2 mm – 3.2 mm, mean 2.7 mm, n=8
Blade Length:	13 mm – 19.4 mm, mean 16.3 mm, n=7
Blade Width:	11.2 mm – 13.6 mm, mean 12.6 mm, n=7
Haft Width:	4.1 mm – 7.7 mm, mean 6.2 mm, n=8
Base Width:	7.6 mm – 9.8 mm, mean 8.7 mm, n=5

Material Types: Chert (50%), Chalcedony (12%), Quartzite (38%)

CATEGORY P64 (Figure 5.15)

Number of Artifacts: 1 projectile point base

Catalogue Number: 5LA7400.0.32

Description: The single projectile point assigned to this category has a bi-convex cross-section, I-E recurved blade edges, barbed shoulders, a slightly expanding stem, pointed tangs, and a convex base. An age estimate of A.D. 800 to A.D. 1200 is suggested for this style (Anderson 1989:197-198).

Metric Attributes:

Length:	-----
Width:	12.6 mm, n=1
Greatest Thickness:	3.4 mm, n=1
Blade Length:	-----
Blade Width:	13.5 mm, n=1
Haft Width:	4.7 mm, n=1
Base Width:	7.1 mm, n=1

Material Types: Chert (100%)

CATEGORY P66 (Figure 5.15)

Number of Artifacts: 2 total; 1 complete point, 1 nearly complete point

Catalogue Numbers: 5LA7316.0.4, 5LA7421.0.2

Description: These points have sharp tips, bi-planar or plano-convex cross-sections, straight or slightly convex blade edges, rounded shoulders, expanding stems, rounded tangs, and convex bases. These points are thought to date between A.D. 800 and A.D. 1450 (Anderson 1989:199-200).

Metric Attributes:

Length:	20.1 mm – 20.8 mm, mean 20.5 mm, n=2
Width:	15.5 – 15.7 mm, mean 15.6 mm, n=2
Greatest Thickness:	2.7 mm – 3.8 mm, mean 3.2 mm, n=2
Blade Length:	14.6 mm – 15.7 mm, mean 15.2 mm, n=2
Blade Width:	15.5 mm – 15.7 mm, mean 15.6 mm, n=2
Haft Width:	9.7 mm – 11.4 mm, mean 10.6 mm, n=2
Base Width:	11.5 mm – 13.4 mm, mean 12.5 mm, n=2

Material Types: Chert (100%)

CATEGORY P68 (Figure 5.15)

Number of Artifacts: 1 projectile point base

Catalogue Number: 5LA7309.0.1

Description: This point base has a plano-convex cross-section, convex blade edges, weakly barbed shoulders, an expanding stem, pointed tangs, and a convex base. Anderson (1989:201-203) suggests an age estimate of A.D. 800 to A.D. 1350 for this category.

Metric Attributes:

Length:	-----
Width:	11 mm, n=1
Greatest Thickness:	2.4 mm, n=1
Blade Length:	-----
Blade Width:	11 mm, n=1
Haft Width:	5.9 mm, n=1
Base Width:	9 mm, n=1

Material Types: Chert (100%)

CATEGORY P70 (Figure 5.16)

Number of Artifacts: 1 nearly complete point

Catalogue Number: 5LA7530.0.3

Description: This point has a very sharp tip, a plano-convex cross-section, concave blade edges, abrupt shoulders, a slightly expanding stem, rounded tangs, and a nearly straight base. No age estimate is suggested for this category, but they may date to the Woodland period (Anderson 1989:204).

Metric Attributes:

Length:	16.2 mm, n=1
Width:	12 mm, n=1
Greatest Thickness:	2.4 mm, n=1
Blade Length:	14.4 mm, n=1
Blade Width:	12 mm, n=1
Haft Width:	8.8 mm, n=1
Base Width:	9.2 mm, n=1

Material Types: Chalcedony (100%)

CATEGORY P74 (Figure 5.16)

Number of Artifacts: 1 complete projectile point

Catalogue Number: 5LA4938.0.10

Description: This projectile point is irregular and poorly thinned, which suggests the artifact may be a rejected preform, but it is notched and otherwise appears finished. This artifact is one of only three small points that were made from basalt. The high fracture toughness of this material may have contributed to the poorly executed thinning. It has a sharp tip, bi-planar cross-section, straight blade edges, nearly abrupt shoulders, a slightly expanding stem, rounded tangs, and a straight base.

Metric Attributes:

Length:	13.8 mm, n=1
Width:	11 mm, n=1
Greatest Thickness:	2.2 mm, n=1
Blade Length:	12.2 mm, n=1
Blade Width:	11 mm, n=1
Haft Width:	7.1 mm, n=1
Base Width:	9.2 mm, n=1

Material Types: Basalt (100%)

Small Contracting-Stem Point Class

This point class is very rare in the Black Hills assemblage. This class appears to be rare throughout the PCMS, and constituted only 1.1% of the point assemblage considered by Anderson (1989:208). Only a single projectile point from the Black Hills survey was classified as this type. Contracting-stem projectile points were also very rare in the large point assemblage.

CATEGORY P76 (Figure 5.16)

Number of Artifacts: 1 projectile point base

Catalogue Number: 5LA7400.0.19

Description: This small asymmetrical point base has a bi-convex cross-section, straight blade edges, abrupt shoulders, a contracting stem, rounded tangs, and a convex base. An age estimate of A.D. 800 to A.D. 1100 is suggested for this style (Anderson 1989:209).

Metric Attributes:

Length:	-----
Width:	8.8 mm, n=1
Greatest Thickness:	2.5 mm, n=1
Blade Length:	-----
Blade Width:	8.8 mm, n=1
Haft Width:	4.2 mm, n=1
Base Width:	2.4 mm, n=1

Material Types: Chert (100%)

Small Flange Stem Point Class

This point class was one of the most common in the Black Hills and includes almost 20% of the classifiable assemblage. A total of 32 artifacts in five different categories were assigned to this class. The class includes some of the most recent point styles in the assemblage, which may in part, account for the abundance of this point class. These artifacts date largely from the end of the Early Ceramic period to the Protohistoric period.

CATEGORY P79 (Figures 5.16, 5.17)

Number of Artifacts: 15 total; 8 point bases, 4 nearly complete points, and 3 complete points

Catalogue Numbers: 5LA6125.0.22, 5LA7310.0.3, 5LA7341.0.6, 5LA7341.0.7, 5LA7341.0.12, 5LA7393.0.3, 5LA7421.0.5, 5LA7433.0.1, 5LA7400.0.7, 5LA7407.0.2, 5LA7471.0.4, 5LA7498.0.5, 5LA7551.0.3, 5LA7551.0.4, 5LA7745.0.1

Description: This point category was one of the most common in the Black Hills, but despite the comparatively large number of points their attributes were relatively consistent. These points have very sharp tips, bi-convex or plano-convex cross-sections, straight blade edges, abrupt shoulders, expanding flange stems, pointed tangs, and straight or concave bases. These projectile points appear to date between A.D. 1000 and A.D. 1750 (Anderson 1989:211-213).

Metric Attributes:

Length:	14.7 mm – 26 mm, mean 21.4 mm, n=6
Width:	12.3 mm – 19.2 mm, mean 14 mm, n=13
Greatest Thickness:	1.9 mm – 4.2 mm, mean 3.1 mm, n=15
Blade Length:	13.8 mm – 18.2 mm, mean 14 mm, n=6
Blade Width:	10.5 mm – 14.2 mm, mean 12.1 mm, n=10
Haft Width:	6.4 mm – 9.6 mm, mean 7.7 mm, n=15
Base Width:	11.9 mm – 19.2 mm, mean 14.3 mm, n=11

Material Types: Chert (53%), Quartzite (33%), Chalcedony (7%), Obsidian (7%)

CATEGORY P82 (Figure 5.17)

Number of Artifacts: 1 complete projectile point

Catalogue Number: 5LA7365.0.3

Description: The single point assigned to this category has a sharp tip, plano-convex cross-section, straight blade edges, abrupt shoulders, a straight flange stem, pointed tangs, and a

straight base with centrally placed U-shaped notch. Anderson (1989:215-217) suggests that this category dates between A.D. 750 and A.D. 1725.

Metric Attributes:

Length:	19.4 mm, n=1
Width:	13.1 mm, n=1
Greatest Thickness:	2.9 mm, n=1
Blade Length:	14 mm, n=1
Blade Width:	13.1 mm, n=1
Haft Width:	7.6 mm, n=1
Base Width:	13 mm, n=1

Material Types: Chert (100%)

CATEGORY P83 (Figure 5.17)

Number of Artifacts: 12 total; 9 point bases, 2 nearly complete points, and 1 complete point

Catalogue Numbers: 5LA4938.0.13, 5LA7281.0.2, 5LA7310.0.8, 5LA7341.0.2, 5LA7341.0.5, 5LA7391.0.4, 5LA7393.0.2, 5LA7400.0.12, 5LA7421.0.3, 5LA7541.0.1, 5LA7600.0.31, 5LA7738.0.1

Description: This point category was also common in the assemblage and accounts for 7% of the artifacts. These triangular side-notched points have very sharp tips, bi-convex or plano-convex cross-sections, straight or convex blade edges, abrupt shoulders, straight flange stems, pointed tangs, and straight or concave bases. These projectile points appear to date between A.D. 750 and A.D. 1650 (Anderson 1989:217-221).

Metric Attributes:

Length:	15.5 mm – 30 mm, mean 21.2 mm, n=3
Width:	8.9 mm – 15.5 mm, mean 15.5 mm, n=11
Greatest Thickness:	2.2 mm – 4.2 mm, mean 3 mm, n=12
Blade Length:	11.5 mm – 23.1 mm, mean 15.4 mm, n=3
Blade Width:	8.9 mm – 15.5 mm, mean 11.7 mm, n=11
Haft Width:	5.1 mm – 9.4 mm, mean 12.5 mm, n=11
Base Width:	7.6 mm – 14.7 mm, mean 12.4 mm, n=8

Material Types: Chert (42%), Quartzite (50%), Basalt (8%)

CATEGORY P84 (Figure 5.17)

Number of Artifacts: 1 projectile point base

Catalogue Number: 5LA7328.0.3

Description: The single point assigned to this category is highly fragmentary and may possibly be classified in Category P79. This artifact has a bi-convex cross-section, straight blade edges, abrupt shoulders, a straight flange stem, and pointed tangs.

Metric Attributes:

Length:	-----
Width:	-----
Greatest Thickness:	2.5 mm, n=1
Blade Length:	-----
Blade Width:	-----
Haft Width:	5.8 mm, n=1
Base Width:	-----

Material Types: Chert (100%)

CATEGORY P85 (Figure 5.17)

Number of Artifacts: 3 total; 1 point base, 1 nearly complete point, and 1 complete point

Catalogue Numbers: 5LA7319.0.2, 5LA7351.0.9, 5LA7421.0.4

Description: These projectile points have sharp or dull tips, bi-convex cross-sections, straight or irregular blade edges, abrupt shoulders, straight flange or contracting flange stems, rounded or pointed tangs, and straight bases. An age estimate of A.D. 1000 to A.D. 1400 is suggested for this category (Anderson 1989:222-224).

Metric Attributes:

Length:	21 mm, n=1
Width:	11.7 mm – 12.5 mm, mean 12.1 mm, n=3
Greatest Thickness:	2.5 mm – 4.4 mm, mean 3.5 mm, n=3
Blade Length:	17 mm, n=1
Blade Width:	10.8 mm – 12.5 mm, mean 11.7 mm, n=3
Haft Width:	7.5 mm – 8.2 mm, mean 7.8 mm, n=3
Base Width:	11.5 mm – 12.2 mm, mean 11.8 mm, n=3

Material Types: Chert (66%), Chalcedony (34%)

Projectile Point Summary

The projectile points examined in this analysis encompass the range of types that are known for the PCMS, and suggest that the Black Hills (especially the western edge of this area that overlooks the adjacent plains) were a favored location for habitation and other activities throughout the prehistoric sequence. All of the more common categories in the Anderson

typology were found during the Black Hills survey. The density of projectile points in the Black Hills is dramatically higher than in the adjacent Welsh Canyon area (Loendorf and Loendorf 1999:87).

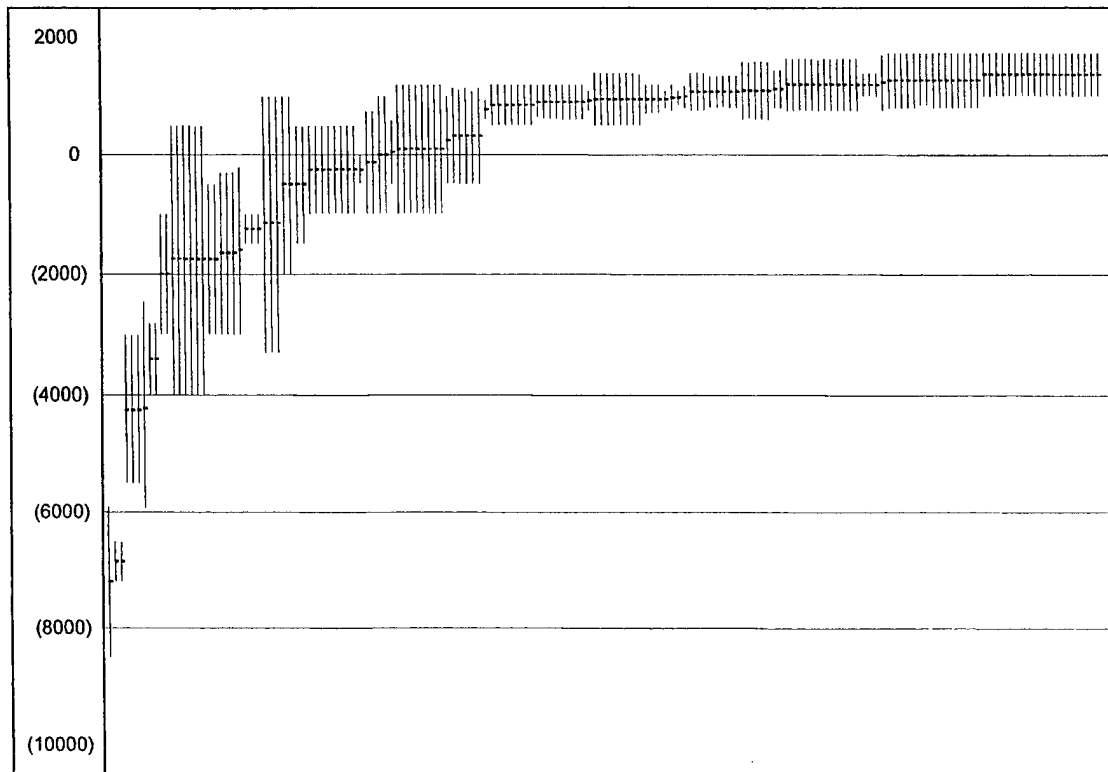


Figure 5.2: Start, end, and midpoints for the projectile points.

The comparatively large numbers of projectile points found in the Black Hills may be the result of at least two factors. First, the western edge of the project area where the points were most concentrated is an ideal location for watching game grazing in the adjacent plains, which is consistent with the suggestion that this area was a favored location for hunting. Second, the trees in this area would provide suitable cover and fuel for fires.

Figure 5.2 graphs the start, end, and midpoints for the 158 projectile points with age estimates. Not surprisingly, more recent point styles are much more common than older points. Age estimates for the points overlap to a great extent, but a gap in the sequence may exist during the Early Archaic period. Few Paleo-Indian projectile points were recovered from the project area; and, because it was reworked, one of the three examples can only be tentatively attributed to this period. The point assemblage is dominated by Early Ceramic to Late Ceramic age projectile points; the midpoints of the age estimates for almost 70% of the projectile points postdate the start of the Early Ceramic period (roughly A.D. 200).

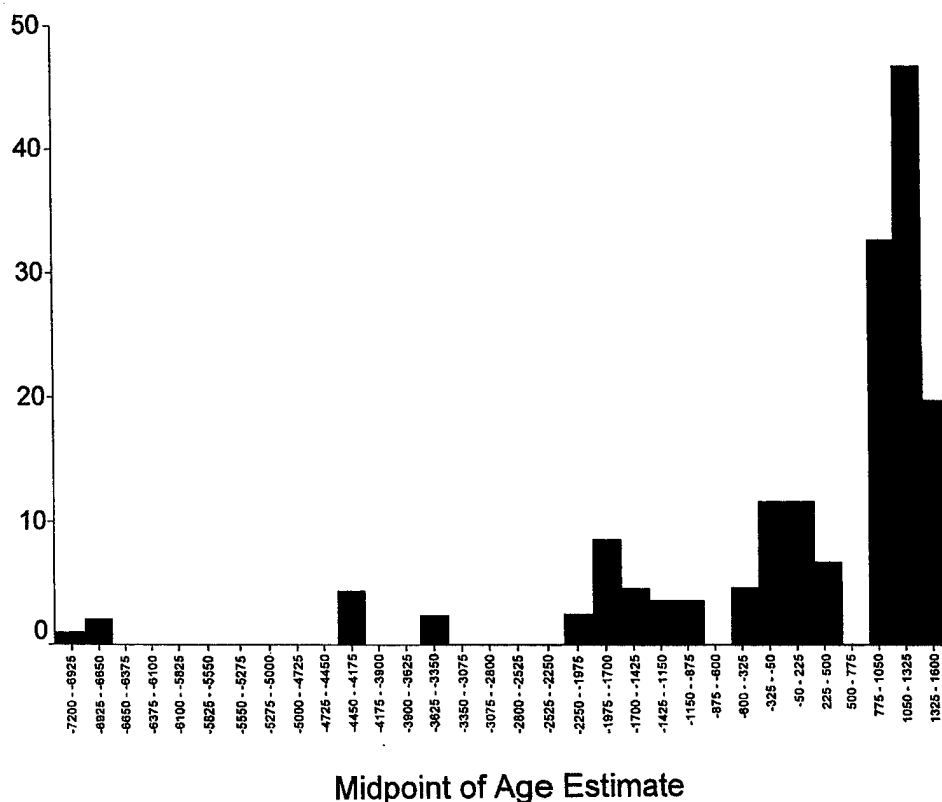


Figure 5.3: Histogram of age estimate midpoints.

Although the start and end dates of the age estimates largely overlap, interesting patterning is apparent when only the midpoints of the age estimates are considered. Figure 5.3 is a histogram of the age estimate midpoints. Examination of this figure suggests that at least three (possibly five) relatively distinct modes are present in these data. The first poorly defined mode occurs during the Paleo-Indian period, with three points that have midpoints between 7200 B.C. to 6850 B.C. A relatively long gap exists in the sequence until a poorly defined group of five points with age estimates between 4250 B.C. and 3400 B.C. The next mode is more clearly defined with 13 points that have midpoints between 2000 B.C. and 1150 B.C. The following mode includes 31 points that date between 500 B.C. and A.D. 325. The final mode includes most of the points in the assemblage (73 total), and begins around A.D. 850 and continues until after A.D. 1375.

This data suggests that the Black Hills experienced periodic episodes of increased point manufacture, interspersed with periods during which fewer points were made. Although it is possible that the fluctuation in point frequencies could simply result from changes in the intensity of the activities for which projectile points were used (i.e., hunting or warfare), it is likely that these oscillations also represent changes in the number of people who were living in the Black Hills. These two issues are not independent, such that periods with increased hunting (also possibly warfare) should be associated with periods of better climatic conditions and larger human populations. This data, however, should not be taken to suggest that the area was abandoned periodically because the point age estimates actually overlap. Put another way, the resolution of the age estimates does not allow the determination of periods of abandonment of

the area, but merely suggest periodic fluctuations in the human population of the Black Hills.

The gaps in the distribution of point age estimates correspond to some extent with the regional climatic model developed by Bryson et al. (1970), which suggests that periods of increased precipitation were interspersed by periods of drought. For example, the most recent gap in the point age estimate distribution (A.D. 325 to A.D. 850) occurs at roughly the same time as the Scandic episode (approximately A.D. 200 to A.D. 900), a period thought to have been characterized by intense heat and drought. The plethora of projectile points with midpoints between A.D. 850 and A.D. 1375 corresponds with the following Neo-Atlantic episode (A.D. 900 to A.D. 1200) and the subsequent Pacific episode (A.D. 1200 to A.D. 1450) when the climate is thought to have been cooler and wetter, especially in the southern plains and northeastern New Mexico (Bryson et al. 1970).

The number of projectile points in the five modes increases through time. Each subsequent mode has roughly twice the number of projectile points as the previous mode. This diachronic increase in projectile points is probably the result of at least two factors. First, this may represent a general increase in the number of people in the region through time. Second, older projectile points are more likely to be rare simply because they have experienced a greater period of time in which they could be buried by deposition, reworked, or otherwise removed from the archaeological record (especially surface contexts).

Diachronic changes in the metric attributes of projectile points are apparent if groups of similarly dated points are compared. The Paleo-Indian points are combined with the Early Archaic points because of the small sample sizes. Figure 5.4 presents boxplots of stem to base width ratio for finished points; this ratio appears to have decreased through time. This variable is one of the criteria that Anderson employed to define the point categories, but characteristics that were not classification criteria also exhibit diachronic patterning. Table 5.4 presents correlation coefficients for several metric attributes and the start dates of the age estimates. All of the metric attributes are negatively correlated with the age of the projectile points (i.e., projectile points appear to have become progressively smaller through time).

Interestingly, the strength of the correlation coefficients between the age estimates and metric attributes closely follow functional constraints of projectile points. The strongest association (Pearson correlation -0.74) is between the thickness of the stem and the start date of the age estimates in years before present (Figure 5.5). Stem thickness was not employed in any way to classify these points, but stem thickness is the most functionally constrained characteristic of points. This is because points were hafted onto shafts, and it is not possible to socket haft a point that is thicker than the shaft diameter (realistically the point thickness would need to be less than half the shaft diameter). The next highest correlation (Pearson correlation -0.68) is for the width of the point stem, which is also constrained by the shaft diameter, although to a lesser extent than stem thickness. While it is possible to haft a point that has a stem that is wider than the shaft diameter, it is difficult to securely fasten these points because the binding materials (i.e., sinew) are cut by the sharp edges of the notches or stem.

If these two suggestions about the functional constraints of basal attributes are correct, then stem thickness should generally be less than half the stem width. This is because the stem

width should be roughly the same as (or less than) the shaft diameter, and stem thickness should be less than half of this diameter. Figure 5.6 is a histogram of the ratio between stem thickness and stem width. As expected, this ratio is less than 0.5 for almost all points.

Point weight has the next highest correlation (Pearson correlation -0.65) with the start date of the age estimates. Point weight is functionally constrained by the necessity to balance projectiles in order to insure true flight. It is possible, however, to balance the shafts by adding weight in the form of binding agents (i.e., sinew or pine pitch). The remaining metric attributes all have relatively low correlation coefficients, which suggests that these aspects of projectile points were not as functionally constrained.

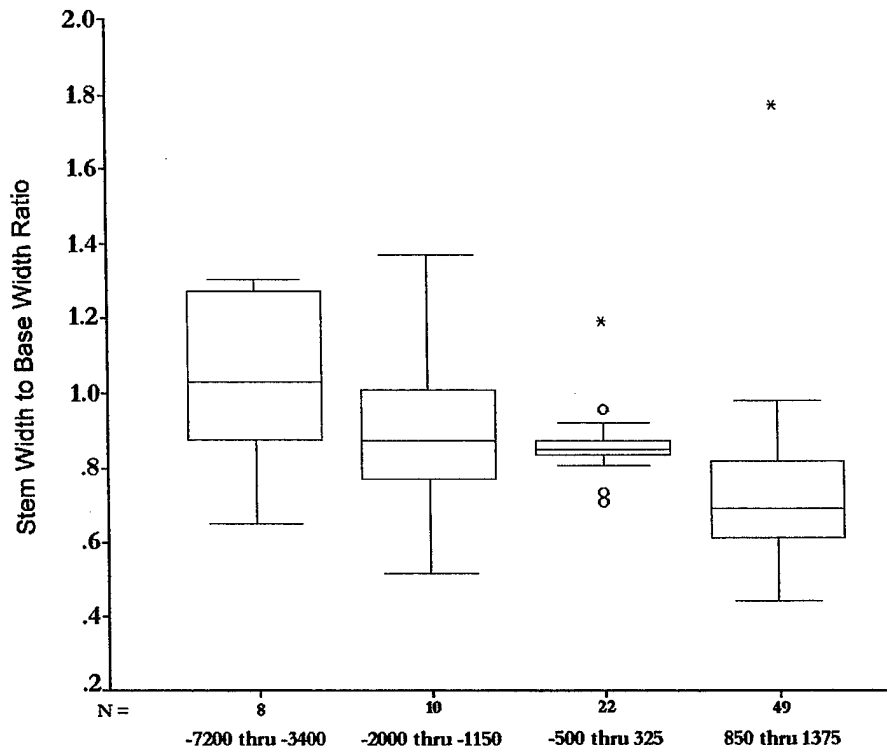


Figure 5.4: Stem to base width ratio boxplots for finished points.

The patterning in these data suggests the Anderson typology can be used to seriate projectile points in a meaningful order. The comparatively high correlation between stem thickness and age estimates suggests that this variable may be an important basis for the classification of projectile point assemblages that has previously been overlooked. Stem thickness also has the advantage that it can be measured for most points that can be classified, because the classification system is largely based on basal attributes.

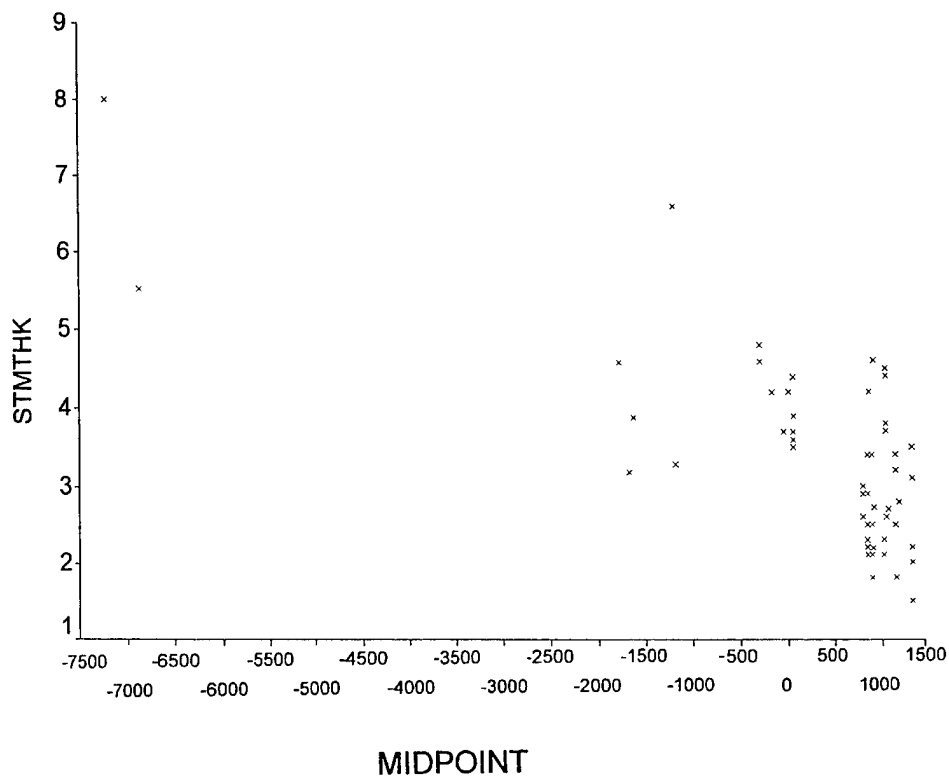


Figure 5.5: Correlation between stem thickness and the midpoint of the age estimates.

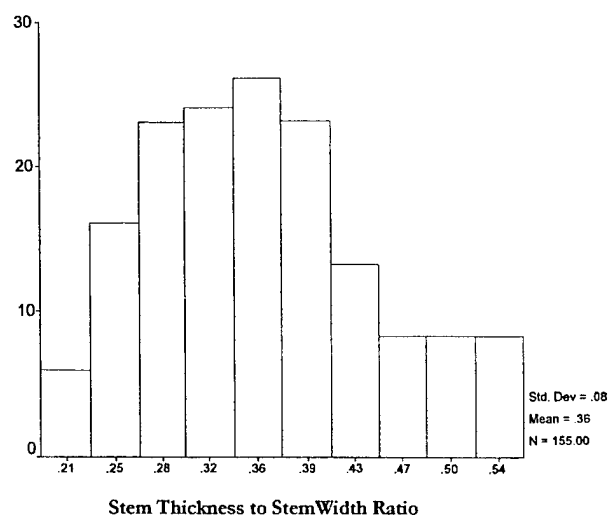


Figure 5.6: Histogram of the stem thickness to stem width ratio.

Table 5.4: Correlation Coefficients for Selected Metric Attributes and the Midpoint of the Age Estimate

	Greatest Width	Stem Width	Base Width	Blade Width	Stem Thick	Midpoint of Age	Point Length	Weight
Greatest Width								
Pearson Correlation	1.000	.820**	.576**	.963**	.768**	-.491**	.767**	.838**
Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
N	161	138	89	139	139	117	58	160
Stem Width								
Pearson Correlation	.820**	1.000	.824**	.788**	.820**	-.659**	.645**	.754**
Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
N	138	156	99	135	155	125	59	156
Base Width								
Pearson Correlation	.676**	.824**	1.000	.573**	.636**	-.359**	.518**	.495**
Sig. (2-tailed)	.000	.000		.000	.000	.001	.000	.000
N	89	99	101	87	100	89	45	101
Blade Width								
Pearson Correlation	.963**	.788**	.573**	1.000	.743**	-.516**	.775**	.809**
Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000
N	139	135	87	139	135	115	58	139
Stem Thickness								
Pearson Correlation	.768**	.820**	.636**	.743**	1.000	-.717**	.744**	.808**
Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
N	139	155	100	135	161	126	58	161
Midpoint of Age Estimate								
Pearson Correlation	-.491**	-.659**	-.359**	-.516**	-.717**	1.000	-.515**	-.647**
Sig. (2-tailed)	.000	.000	.001	.000	.000		.000	.000
N	117	125	89	115	126	126	56	126
Point Width								
Pearson Correlation	.767**	.645**	.518**	.775**	.744**	-.515**	1.000	.885**
Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
N	58	59	45	58	58	56	59	59
Weight								
Pearson Correlation	.838**	.754**	.495**	.809**	.808**	-.647**	.885**	1.000
Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
N	160	156	101	139	161	126	59	200

**. Correlation is significant at the 0.01 level (2-tailed).

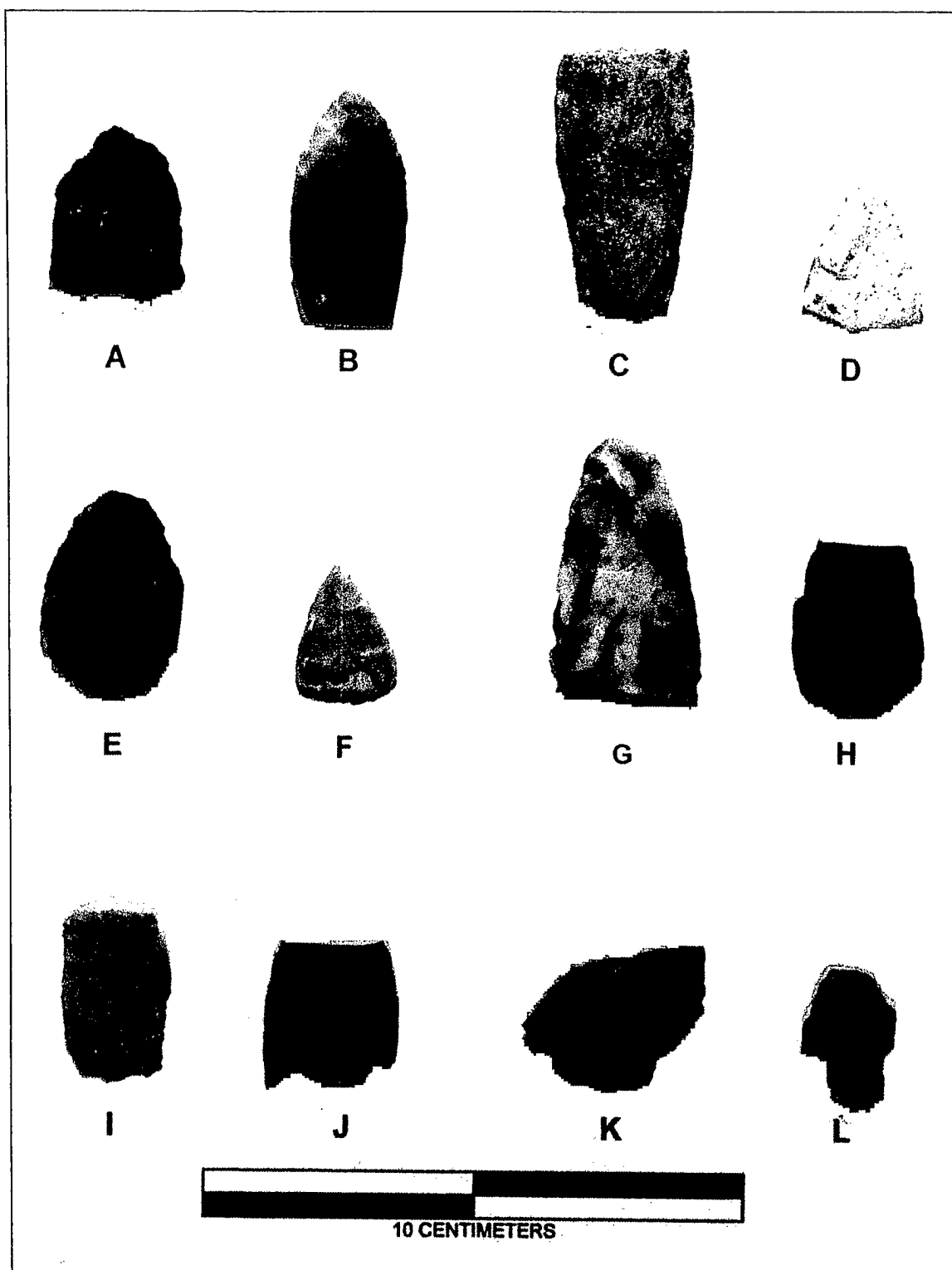


Figure 5.7. Diagnostic Projectile Points: A- 5LA7303.0.19; B- 5LA7419.0.1; C- 5LA7418.0.1; D- 5LA7284.0.5; E- 5LA7342.0.14; F- 5LA7359.0.3; G- 5LA7341.0.11; H- 5LA7328.0.2; I- 5LA7313.0.2; J- 5LA7451.0.2; K- 5LA7429.0.4; L- 5LA7446.0.1

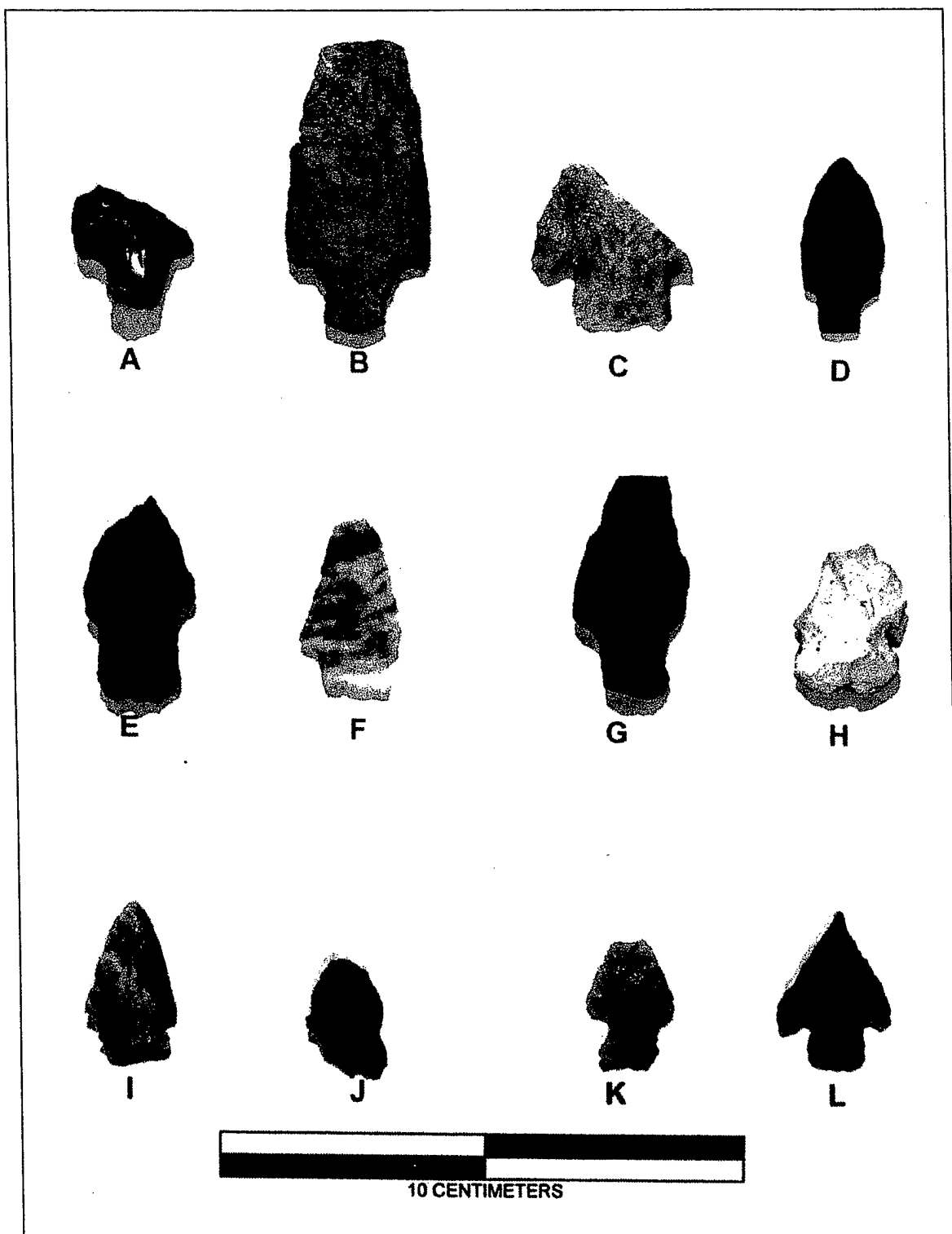


Figure 5.8. Diagnostic Projectile Points: A- 5LA7452.0.4; B- 5LA7444.0.1; C- 5LA7341.0.17; D- 5LA7351.0.5; E- 5LA7303.0.2; F- 5LA4938.0.4; G- 5LA7303.0.3; H- 5LA4938.0.8; I- 5LA7328.0.1; J- 5LA7429.0.3; K- 5LA7533.0.1; L- 5LA7453.0.3

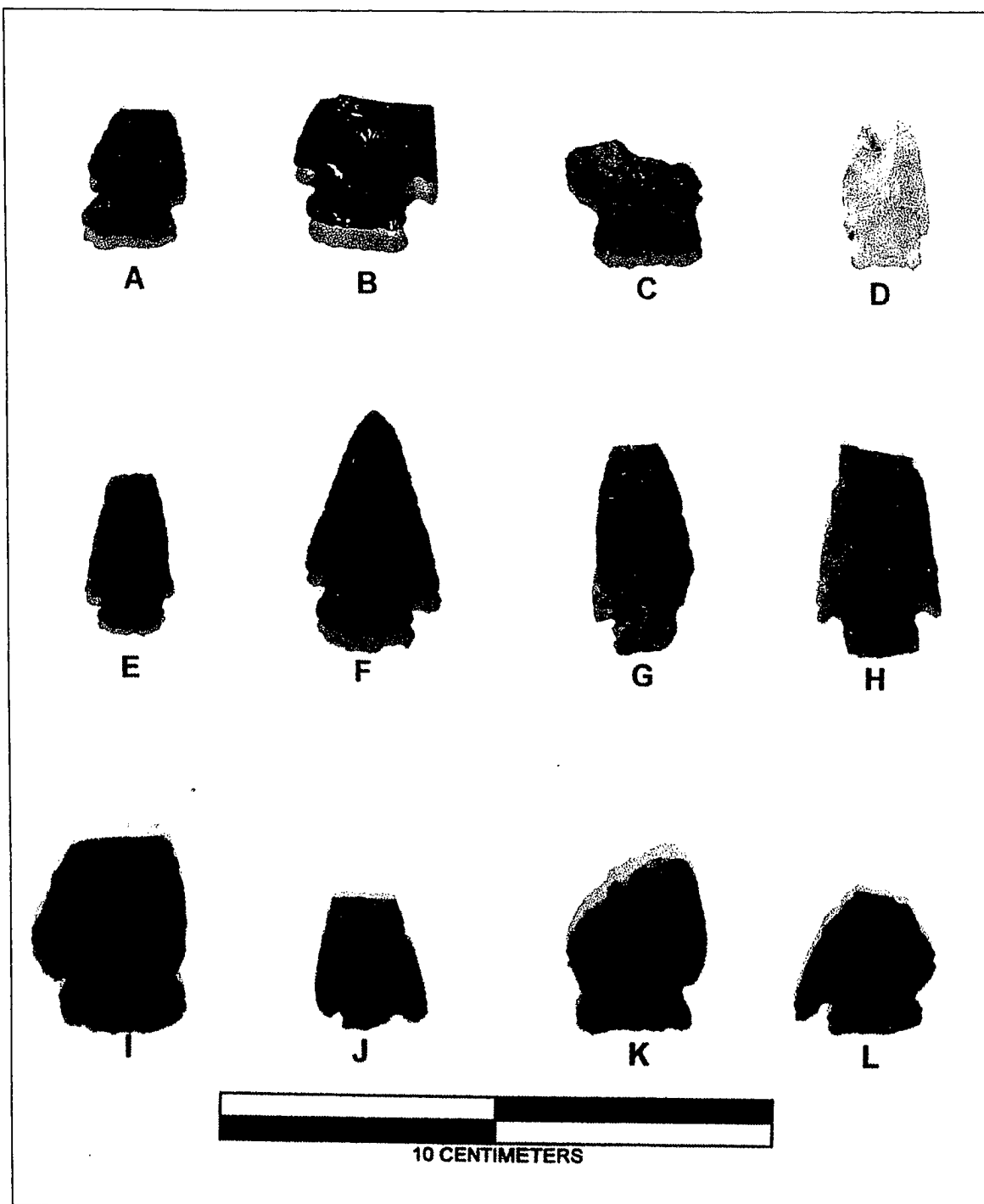


Figure 5.9. Diagnostic Projectile Points: A- 5LA7306.0.1; B- 5LA7416.0.1; C- 5LA7409.0.2; D- 5LA7400.0.13; E- 5LA7400.0.9; F- 5LA7522.0.1; G- 5LA7304.0.2; H- 5LA7452.0.7; I- 5LA7420.0.1; J- 5LA7596.0.1; K- 5LA7303.0.1; L- 5LA7581.0.6

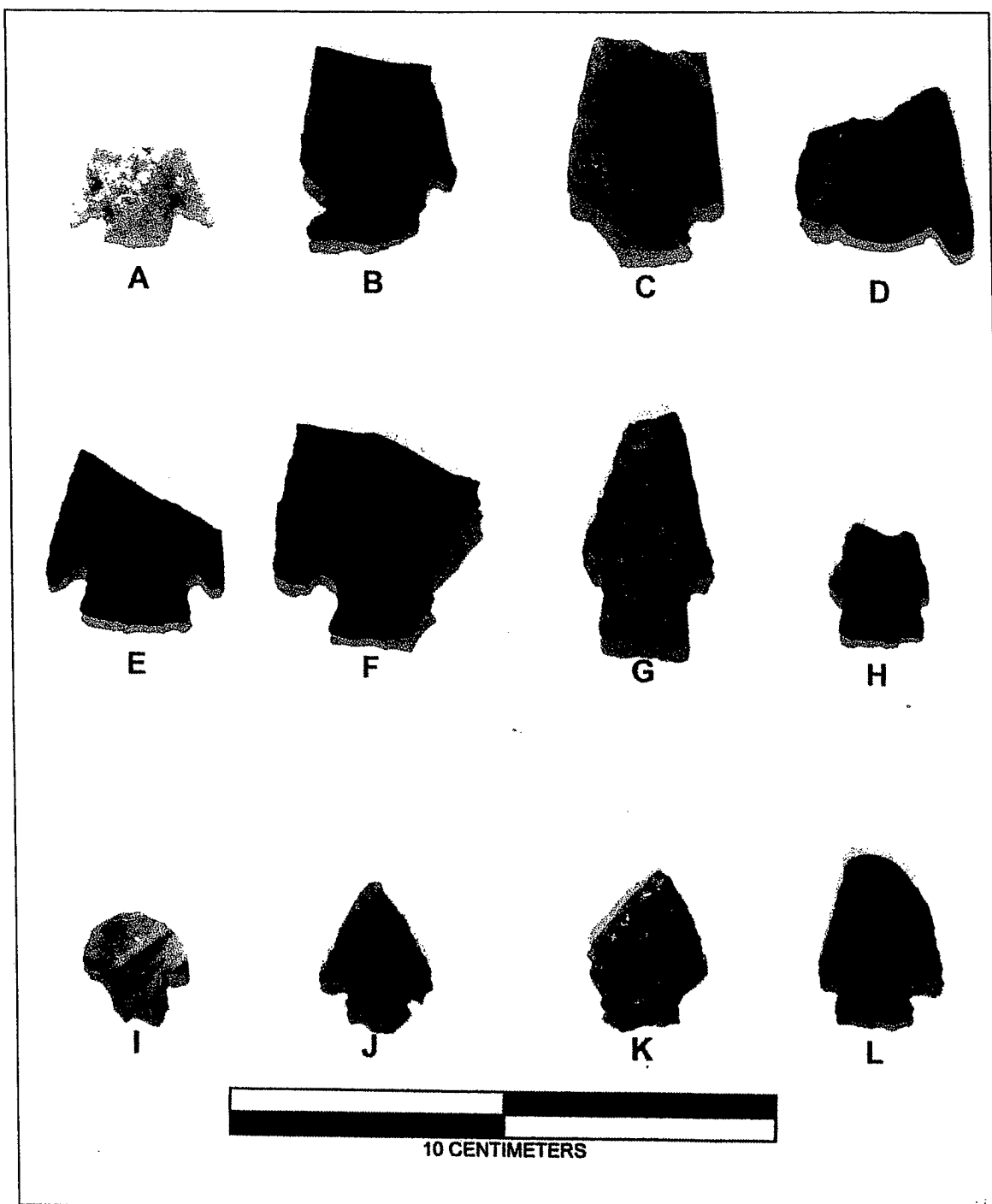


Figure 5.10. Diagnostic Projectile Points: A- 5LA7354.0.1; B- 5LA7351.0.6; C- 5LA7341.0.4; D- 5LA7282.0.15; E- 5LA7347.0.2; F- 5LA7453.0.6; G- 5LA7569.0.1; H- 5LA7414.0.3; I- 5LA7331.0.2; J- 5LA7356.0.2; K- 5LA7772.0.1; L- 5LA7556.0.1

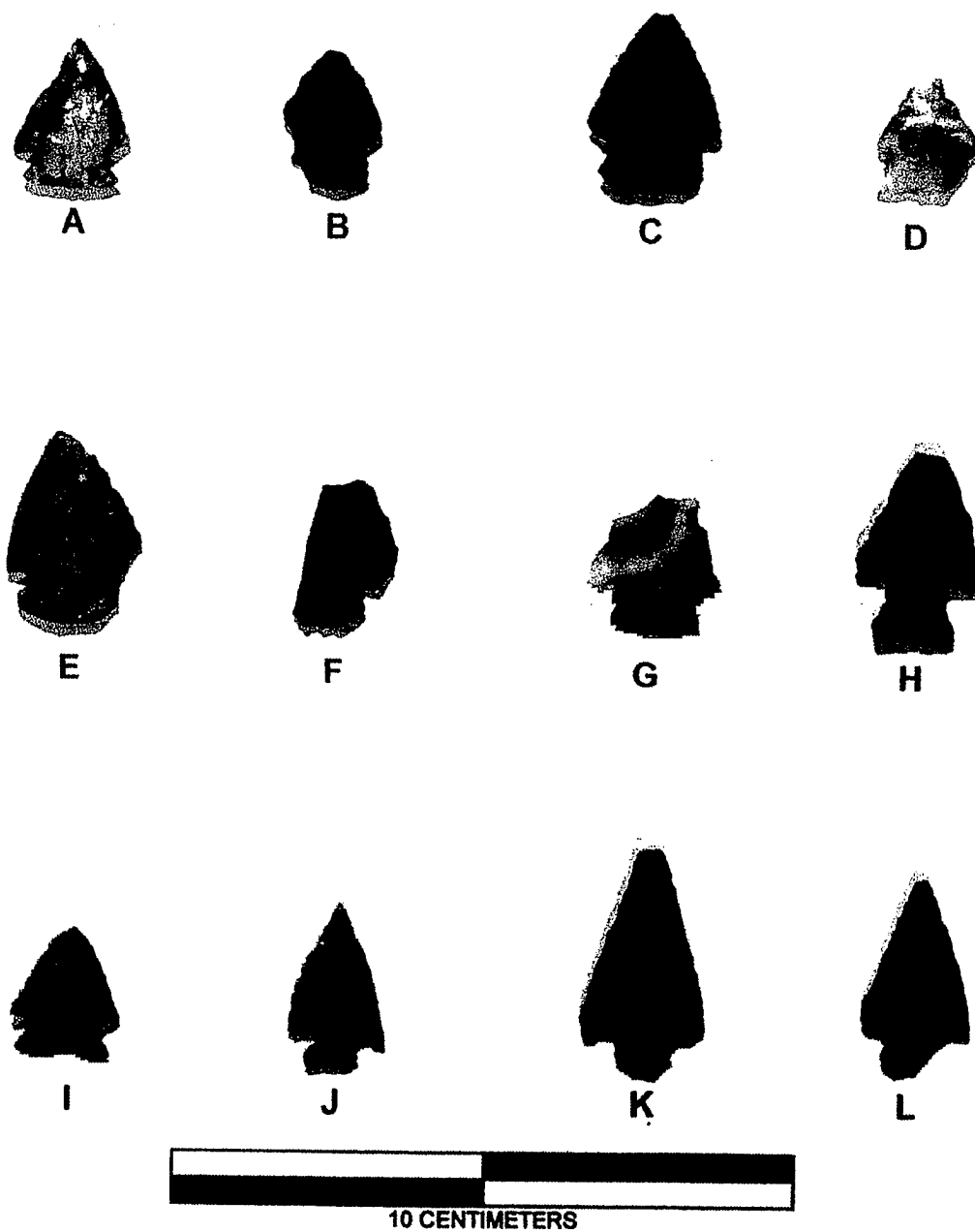


Figure 5.11. Diagnostic Projectile Points: A- 5LA7357.0.13; B- 5LA7265.0.2; C- 5LA7273.0.9; D- 5LA7424.0.1; E- 5LA7430.0.1; F- 5LA7277.0.6; G- 5LA7774.0.1; H- 5LA7265.0.1; I- 5LA7348.0.1; J- 5LA7493.0.3; K- 5LA7507.0.5; L- 5LA7310.0.1

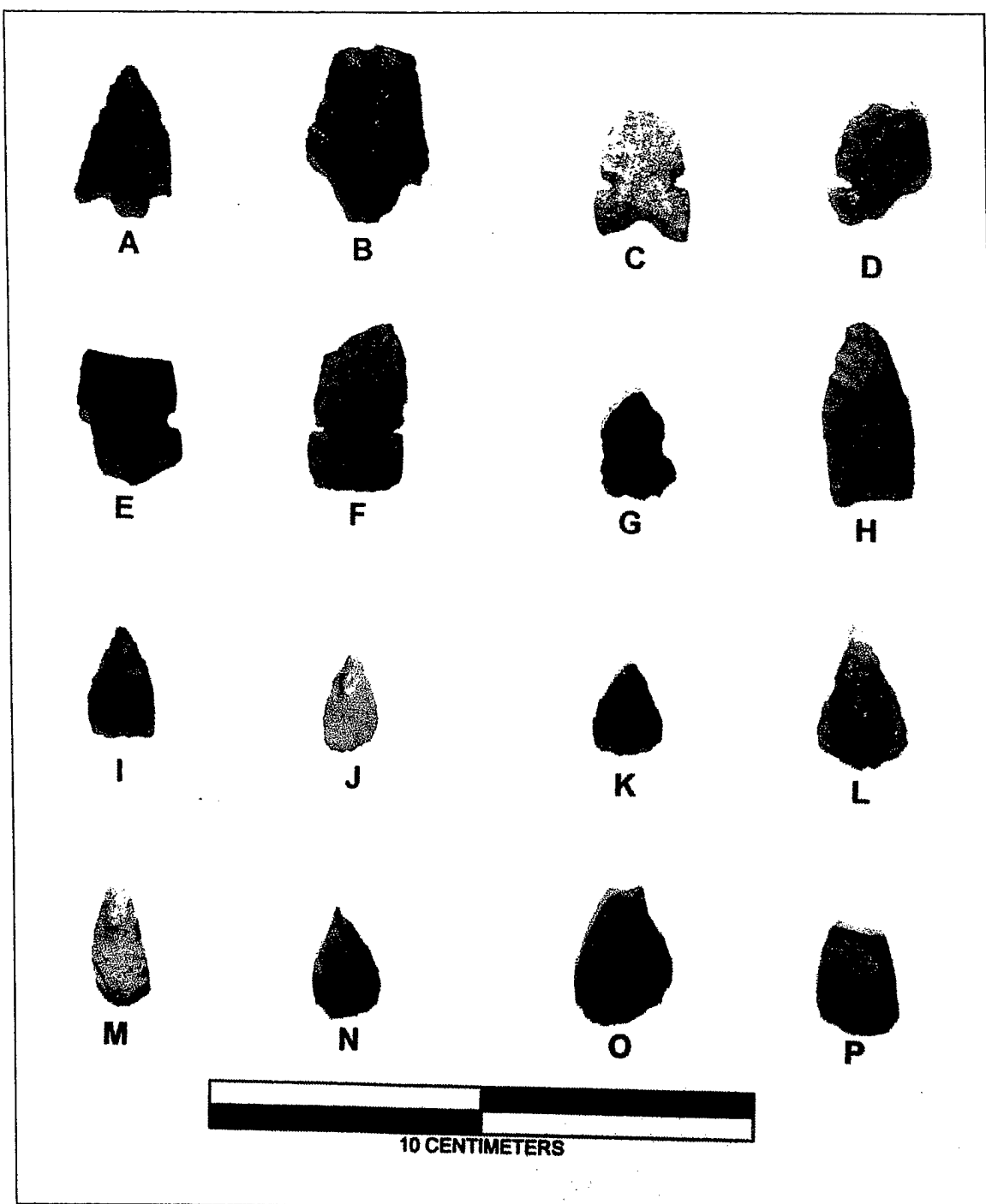


Figure 5.12. Diagnostic Projectile Points: A- 5LA7403.0.5; B- 5LA6125.0.19; C- 5LA7278.0.1; D- 5LA7359.0.1; E- 5LA7320.0.4; F- 5LA7461.0.1; G- 5LA7342.0.8; H- 5LA7277.0.3; I- 5LA7317.0.2; J- 5LA7518.0.3; K- 5LA7518.0.1; L- 5LA7600.0.9; M- 5LA7600.0.30; N- 5LA7438.0.8; O- 5LA7581.0.1; P- 5LA7438.0.3

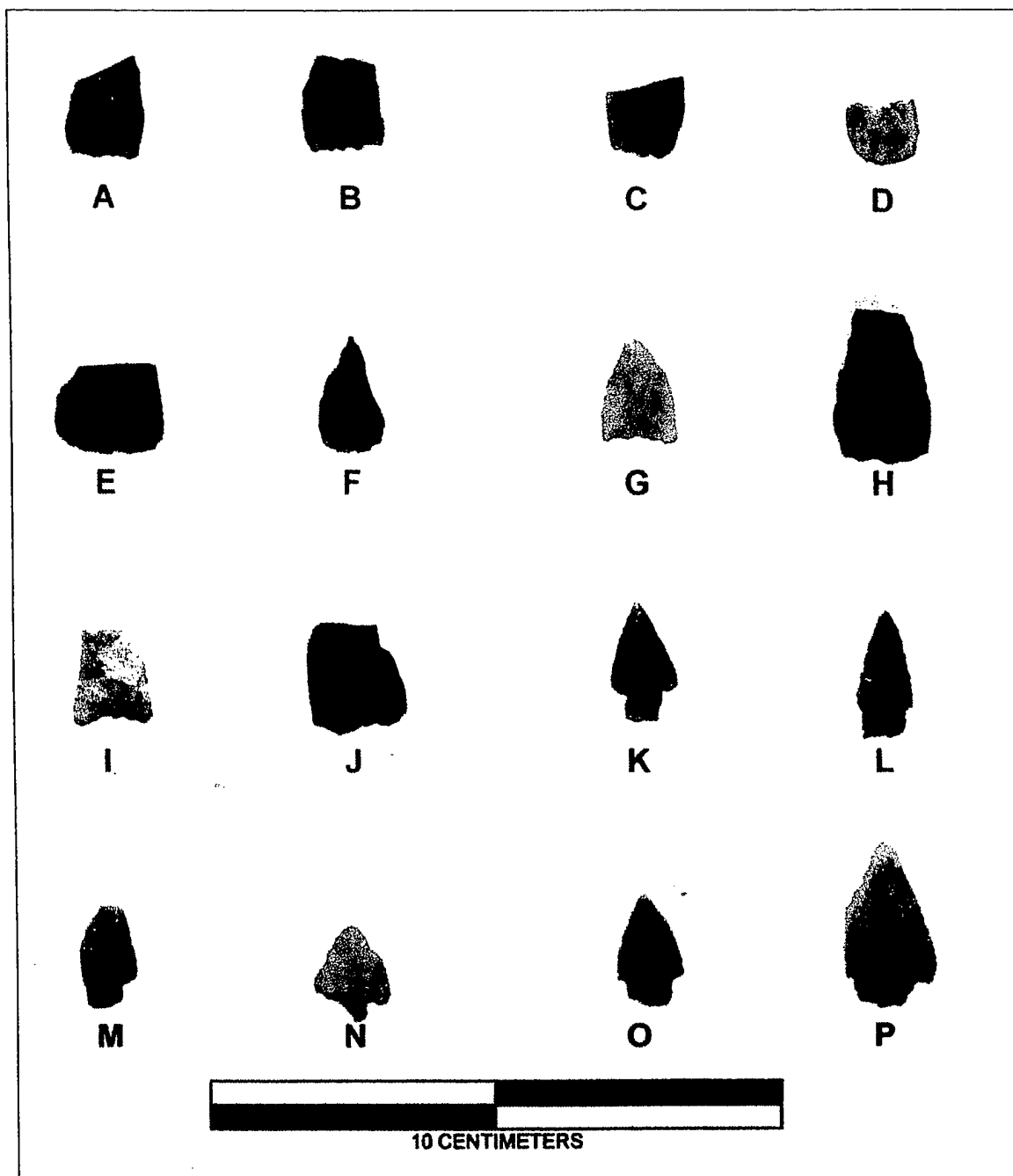


Figure 5.13. Diagnostic Projectile Points: A- 5LA6125.0.14; B- 5LA7443.0.4; C- 5LA7421.0.14; D- 5LA7351.0.8; E- 5LA7538.0.17; F- 5LA7518.0.5; G- 5LA7538.0.4; H- 5LA6125.0.23; I- 5LA6125.0.15; J- 5LA7498.0.4; K- 5LA4938.0.16; L- 5LA7600.0.33; M- 5LA6125.0.3; N- 5LA6626.0.1; O- 5LA7323.0.5; P- 5LA7548.0.3

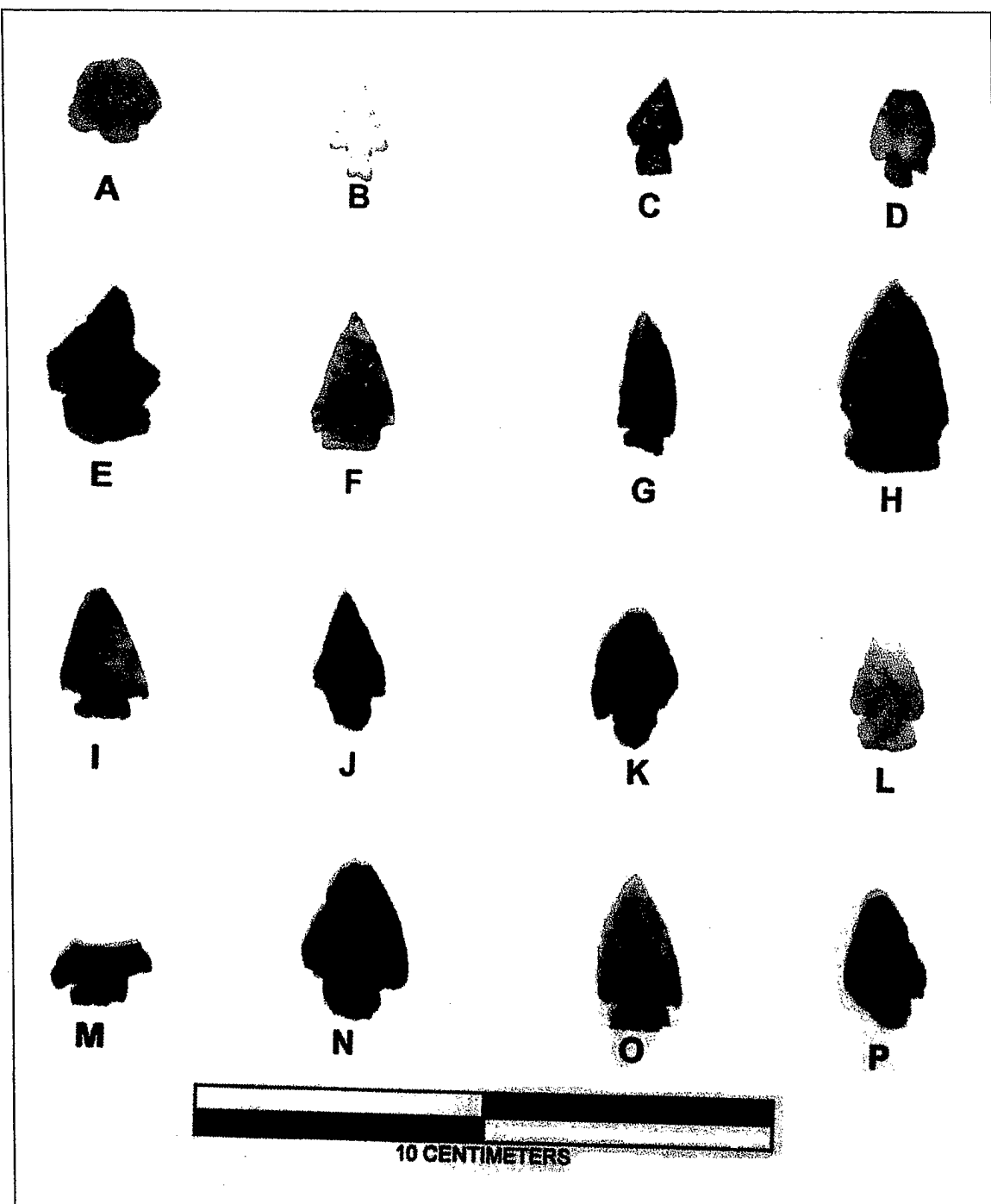


Figure 5.14. Diagnostic Projectile Points: A- 5LA7430.0.3; B- 5LA7353.0.3; C- 5LA7419.0.7; D- 5LA7512.0.3; E- 5LA7553.0.1; F- 5LA7548.0.6; G- 5LA7351.0.2; H- 5LA7471.0.2; I- 5LA6125.0.3; J- 5LA7509.0.7; K- 5LA7538.0.18; L- 5LA7403.0.2; M- 5LA6125.0.11; N- 5LA7420.0.5; O- 5LA7538.0.25; P- 5LA7538.0.24

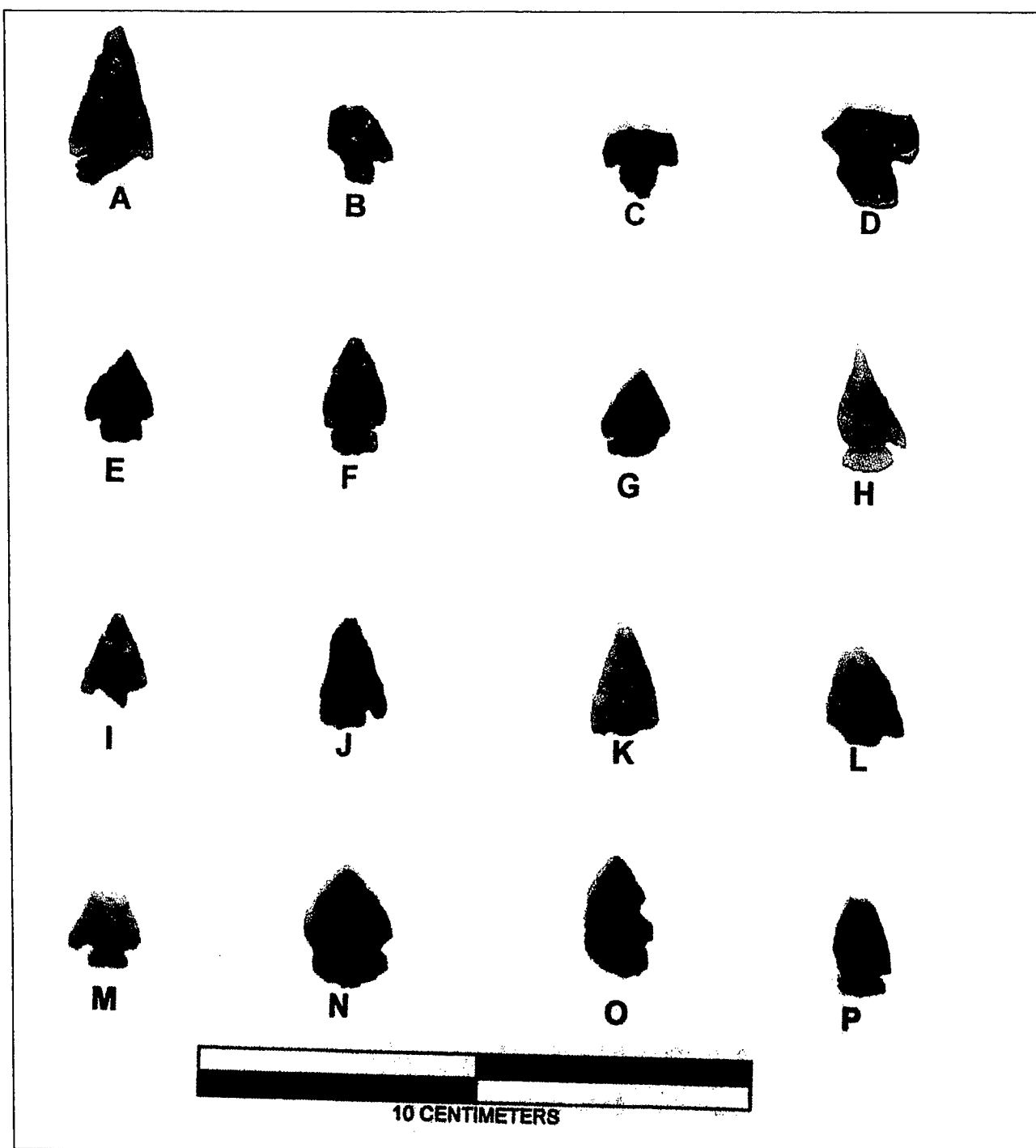


Figure 5.15. Diagnostic Projectile Points: A- 5LA7512.0.2; B- 5LA7416.0.3; C- 5LA7357.0.2; D- 5LA7274.0.5; E- 5LA7365.0.5; F- 5LA7572.0.2; G- 5LA7311.0.4; H- 5LA7572.0.1; I- 5LA7283.0.2; J- 5LA7466.0.2; K- 5LA7554.0.2; L- 5LA7342.0.7; M- 5LA7400.0.32; N- 5LA7316.0.4; O- 5LA7421.0.2; P- 5LA7309.0.1

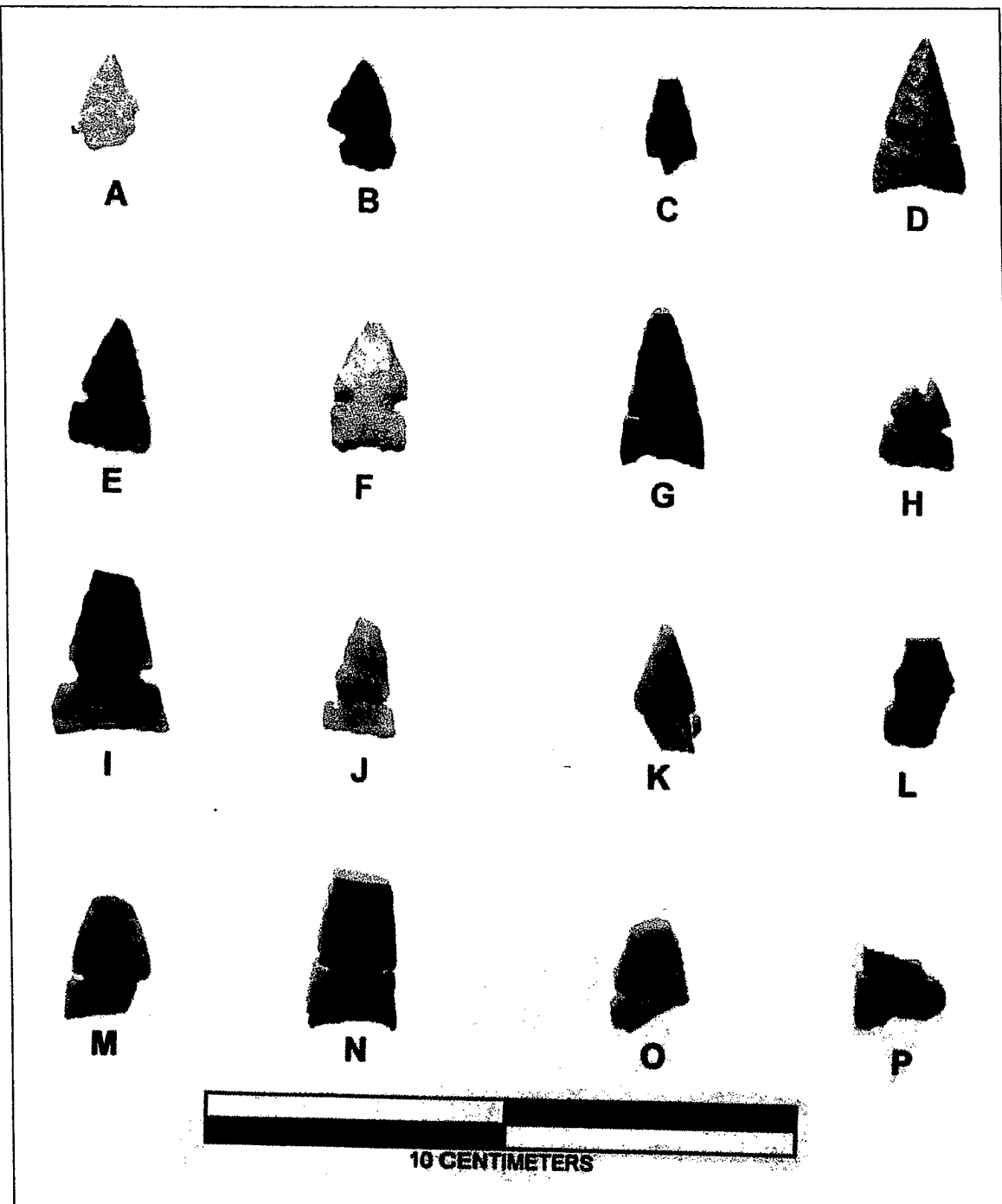


Figure 5.16. Diagnostic Projectile Points: A- 5LA7530.0.3; B- 5LA4938.0.10; C- 5LA7400.0.19; D- 5LA7400.0.7; E- 5LA7498.0.5; F- 5LA6125.0.22; G- 5LA7341.0.6; H- 5LA7471.0.4; I- 5LA7341.0.7; J- 5LA7745.0.1; K- 5LA7407.0.2; L- 5LA7310.0.3; M- 5LA7551.0.4; N- 5LA7551.0.3; O- 5LA7421.0.5; P- 5LA7341.0.12

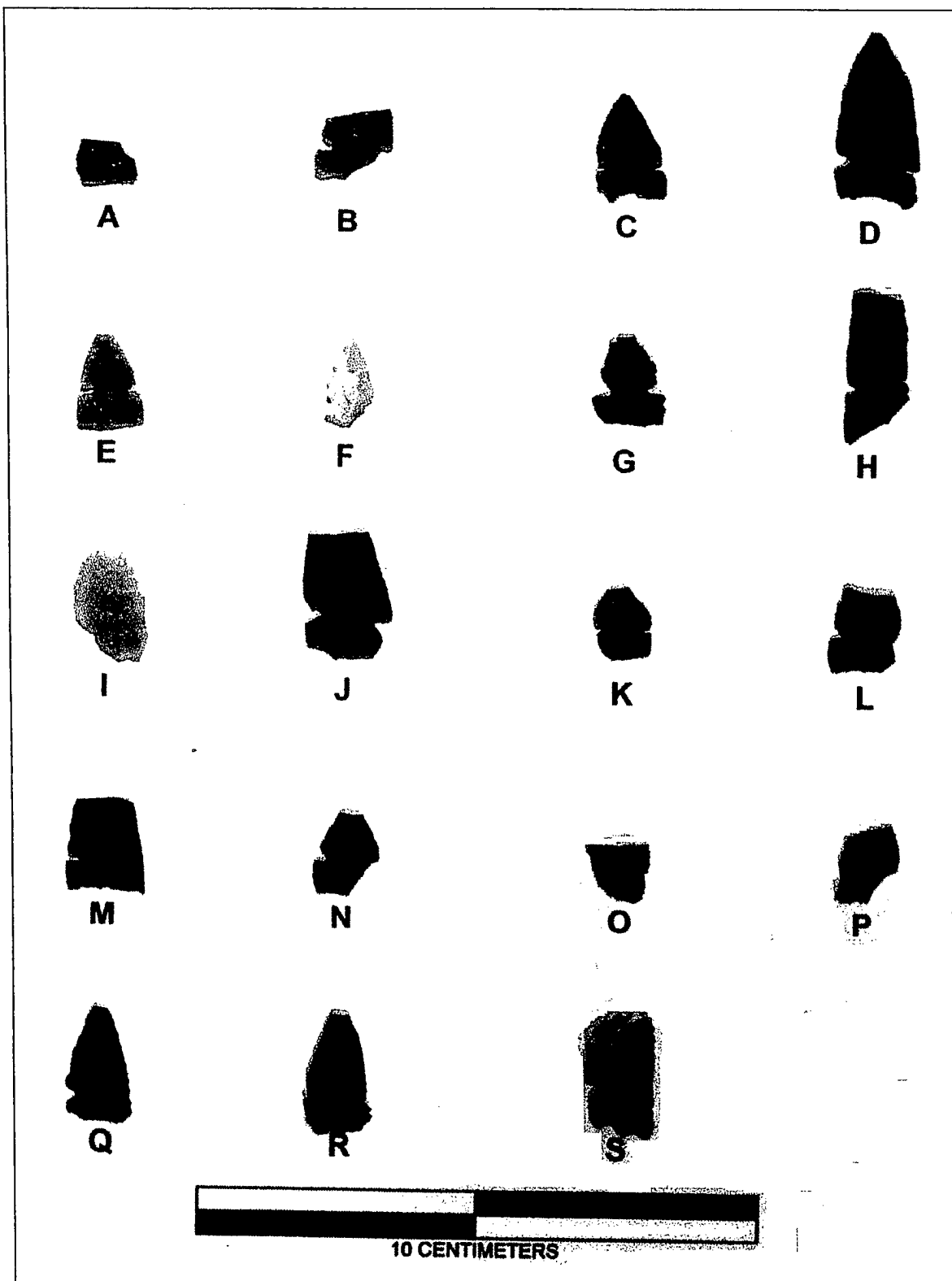


Figure 5.17. A- 5LA7393.0.3; B- 5LA7433.0.1; C- 5LA7365.0.3; D- 5LA7400.0.12; E- 5LA7310.0.8; F- 5LA7600.0.31; G- 5LA7421.0.3; H- 5LA7341.0.5; I- 5LA7391.0.4; J- 5LA7341.0.2; K- 5LA7393.0.2; L- 5LA7281.0.2; M- 5LA4938.0.13; N- 5LA7738.0.1; O- 5LA7541.0.1; P- 5LA7328.0.3; Q- 5LA7319.0.2; R- 5LA7351.0.9; S- 7421.0.4

Chapter VI: Ground-Stone Artifacts and Miscellaneous Items

Three hundred eighty-seven ground stone artifacts from 104 sites were recovered during the 1997 Black Hills Survey. Results from the in field analysis indicate that two functional artifact groups are present. These are manos and metates. The less common tools like polishing stones, and pallet/cooking slabs are grouped under miscellaneous items. In this chapter, all ground-stone artifacts and miscellaneous items are discussed in detail. Table 6.1 summarizes the total counts for the ground-stone artifacts recorded in the field. Most of the edge-ground manos were collected and further analyzed in the lab using the artifact key shown in Appendix VI. A descriptive table that summarizes attribute data on all ground stone and miscellaneous items can be found in Appendix V. Metric data is presented in Tables 6.3, 6.4, 6.5, and 6.7 as well as in the text.

Table 6.1. Summary of Analyzed Ground Stone.

Artifact Type	Total	Percent
Mano	221	57.1%
Metate	162	41.9%
Miscellaneous Items	4	1.0%
Total	387	100.0%

Methods

The ground-stone artifacts were analyzed in the field using an analysis format developed during the 1997 field season that is based on the analysis procedures described in Dean (1992). The general data categories examined for each tool included: artifact type; material type; overall condition; length; width; thickness; burning; surface designation; use area condition, technology; shape; striations; use wear; use location length; use location width; and metate depth. The more complex edge-ground artifacts were collected, and additional recorded information includes: grain size; specific gravity; weight; parent piece (variety); cross-section; outline (planview); secondary battering; secondary mano usage; modification; manufacturing stage (if evident); and descriptions of the facets, bevels, use angles, and striation angles. Measurements for all field artifacts were taken to the nearest centimeter and data for weight was not recorded. All artifacts recorded in the field were viewed without the aid of a hand-lens or microscope. The collected edge-ground tools were measured using a MIDWAY LCD sliding caliper (1 to 120 mm), and weighed with a PELOUZE electronic scale in 0.1 gram increments. All were further viewed under a 5X wide-angle table-mounted lens and a 10X hand lens.

Lithic Materials and Sources

This section describes the variation in lithic materials used and the possible sources of these materials. Evanoff's (1998) canyon stratigraphy column and

lithostratigraphic units and Johnson's (1984) geologic overview and sequence were used to identify the various geologic formations and features exposed along the southern and eastern portion of the PCMS. Crew members performed material type analysis in the field and identification is somewhat subjective.

The ground-stone assemblage reflects the use of a relatively narrow range of raw material types, of which all are available in the immediate project area. Sandstone represents nearly 77 percent of the total material assemblage. Identifiable sources of sandstone include the sedimentary rocks from the Dakota Group, Morrison Formation, Bell Ranch Formation, and Entrada Sandstone. These are exposed in the side canyons and floors of Minne Canyon, Iron Canyon, Stage Canyon, Bravo Canyon, Welsh Canyon, and the Purgatoire River Canyon.

In large parts of the PCMS, the surface geology is attributed to Quaternary alluvium, pediment sediments, and colluvium. Unmodified nodules and cobbles of most of the remaining materials can be seen weathering out at the surface or in intermittent stream gravels.

Olivine basalt is found in the southwest margin of the PCMS and results from a large intrusive dike (the "Hogback").

Manos

Manos are "ground-stone artifacts which exhibit ground surfaces and/or edges. Manos are handheld implements used on large grinding surfaces (metates)" (Bender 1990). The mano class consists of 198 (89%) 1-hand manos, 20 (9%) edge-ground cobbles/manos, two (1%) unknown mano fragments, and one (1%) 2-hand mano specimen. Manos were recovered from 81 of the of the project sites. Table 6.2 presents the data on mano type by material type. Five material types were noted. Of the total assemblage, 67% is sandstone, 27% is quartzite, 4% is basalt, 1% is diorite, and 1% is highly consolidated limestone.

Ninety-seven of the 221 manos are complete. In the remaining specimens, 81 are small fragments, 40 are larger than 50% complete, and in three artifacts the size could not be determined. Complete mano length clusters around 4 to 30 cm (average 10.39 cm), width around 5.5 to 19 cm (average 10.05), and thickness around 2 to 6.5 (average 3.9 cm). The summary metric data for all complete manos is illustrated in Table 6.3. The distinction between one and two-handed manos is subjective. Using the dimensions and width/length ratios of others, Bender (1990) was not able to ascertain a distinct size cut-off for one and two-handed manos. Based on the overall size of the manos, only one highly modified specimen is considered to be of the two-handed variety.

Table 6.2. Material Type by Mano Type

Material	Mano Type				Total
	1 Hand	2 Hand	Edge Ground	Unknown	
Basalt	4	0	3	2	9
Diorite	2	0	0	0	2
Limestone	1	0	0	0	1
Quartzite	57	0	3	0	60
Sandstone	134	1	14	0	149
Total	198	1	20	2	221

Table 6.3. Summary Metric Data for all Whole Manos.

Variable	Valid Number	Manos				Variance
		Minimum	Maximum	Average	Standard Deviation	
Length	96	4	30	10.3969	3.5195	12.3868
Width	96	5.5	19	10.0510	2.8093	7.8922
Thickness	79	2	6.5	3.9279	0.9238	0.8533

Note: All measurements in cm.

All show at least one utilized face or edge. Forty-eight percent of the specimens show two utilized areas, 10% are utilized on three locations, and 5% of the assemblage shows utilization on more than four edges or faces. Wear patterns indicate that 52% of the assemblage has surface grinding only. The remaining artifacts show combination grinding and pecking (37%), grinding and battering (9%), grinding and polishing (1%), or flaking and grinding (1%). In 157 (71%) specimens the striation pattern could not be determined. The visible striation patterns noted during field investigation are transverse (14%), longitudinal (8%), oblique (3%), multiple (3%), and circular (1%). Three degrees of use intensity wear are present in the assemblage. Of these, moderate usage is seen in 46% of the mano assemblage, 38% shows heavy use, and 15% is lightly used. In only 1% of the assemblage the use intensity could not be determined.

All manos are made on natural cobbles or nodules of locally available material and show very little modification prior to or during usage. Viewed in planview the manos are 79% oval, 10% irregular in outline, 7% rectangular, and 1% round. The remaining 3% of the assemblage are highly fragmented and cannot be classified.

One-Hand Manos

These were recorded from 81 separate sites and represent the largest mano class. The one-hand manos are 67% sandstone, 29% quartzite, 2% basalt, 1% diorite, and 1% consolidated limestone. The majority (57%) are broken, with only 43% recorded as complete. A large number (81%) of oval-shaped manos were identified, with irregular (9%), rectangular (6%), and round (1%) planview shapes also seen. Three percent of the assemblage is fragmented, and no planview shape could be determined. Metric data for the one-hand mano group is similar to the all-mano group with length clustering from 4 to 19.7 cm (average 10.12 cm), width clustering from 5.5 to 19 cm (average 10.06 cm), and thickness clustering from 2 cm to 6.5 cm (average 3.9 cm).

Table 6.4. Summary Metric Data for all Whole One-hand Manos.

Variable	Valid Number	One-Hand Manos				
		Minimum	Maximum	Average	Standard Deviation	Variance
Length	84	4	19.7	10.0048	2.8115	7.9046
Width	84	5.5	19	9.9929	2.7534	7.5814
Thickness	68	2	6.5	3.9750	0.9338	0.8721

Note: All measurements in cm.

Like the all-mano class, moderate (47%) use wear dominates the assemblage, with lesser amounts of heavy (35%) and light (16%) usage noted. In three specimens the use-wear intensity could not be determined. The four visible use-wear patterns are grinding (50%), grinding and pecking (39%), grinding and battering (10%), and grinding and flaking (1%). On 70% of the specimens, the striation pattern could not be identified without the aid of further magnification. Examination of the visible striations revealed that 15% of the manos were used in a transverse grinding motion, 8% show longitudinal motion, 3% show oblique motion, 3% were used in multiple directions, and 1% were used in a circular fashion.

Edge-Ground Cobbles/Manos

An edge-ground cobble can occur in several varieties. The most common form is a smooth, flat, water-worn river cobble, generally oval in shape, which has a ground edge that is parallel to its long axis and perpendicular to its short axis. These hand-held implements were presumably used primarily to process hides or, in some cases, were involved in the production of lithic debitage (Darroch 1974). A total of 20 artifacts from 15 sites are classified as edge-ground cobbles or manos. Sixteen of these were collected and further analyzed in the laboratory.

Only three material types (70% sandstone, 15% quartzite, and 15% hornfels/basalt) were identified for the edge-ground manos. A selection preference is seen for medium-grained materials, which amount to 81% of the assemblage. The remaining materials (19%) are fine-grained. These locally available materials were collected in cobble (94%) or chunk/block (6%) form.

For the most part, the measurements for the edge-ground artifacts are larger than the measurements of the all-mano group (Table 6.5). In the 11 complete specimens, the length measures from 11 to 17.5 cm, the width measures from 6.2 to 9.5 cm, and the thickness measures 2.4 to 5.1 cm. The weight data clusters around 696.5 grams, with a minimum of 463.7 grams and a maximum of 920 grams.

Table 6.5. Summary Metric Data for Whole Edge-Ground Cobble/Manos.

Variable	Valid Number	Edge Ground Cobble/Manos				
		Minimum	Maximum	Average	Standard Deviation	Variance
Length	11	7	15	11.6091	3.2758	10.7309
Width	11	6.5	16.5	10.2727	3.3717	11.3682
Thickness	10	2	4.5	3.5000	0.7454	0.5556

Note: All measurements in cm.

In 9 of the 16 cases, the parent piece was apparently modified (grinding and/or battering) to final form before use occurred. Over half (56%) show moderate modification, with heavy (31%) to light (13%) modification also seen. Viewed from the edge, most are oval (n=9, 56%) in cross-section. The remaining artifacts are 19% flattened, 19% plano-convex, and 6% rhomboid. The planviews are irregular (n=9), irregular (n=3), irregular/oval (n=2), and subrectangular (n=2).

Four of the specimens show only one utilized facet. Of those remaining, four exhibit three facets, four have four facets, three have two facets, and one has more than five utilized facets. These tools were held at 50 (oblique) to 90 (transverse) degrees to the surface of wear. Of these, nine were tilted at a fairly steep angle to the material being worked and seven were held nearly flat to slightly tilted. On ten specimens, the facet is single beveled and six show double bevels. When viewed from end to end, the facets are 94% straight and 6 % convex. Seven exhibit abrasion use wear, seven show polish use wear, and two have combination polish and abrasion wear. The majority show transverse striations (88%), with multiple striations (6%), and oblique striations (6%) also seen. Seven show no associated battering. Six have battering on the ends only, two exhibit battering on both the ends and facets, and one shows battering on the facets only. Ten display facial striations and/or grinding and polish from-secondary mano usage.

In 12 cases, these edge-ground mano/cobbles were found in association with other ground-stone artifacts. Eleven of the edge-ground manos were recovered from sites containing temporally diagnostic artifacts or datable structures. Table 6.6 presents the age estimates for datable sites with edge-ground tools.

Table 6.6. List of Sites With Temporally Diagnostic Artifacts/Structures and Edge-Ground Cobble/Manos.

Site	Diagnostic Materials/Structures	Start Date Years	End Date Years
7303	Rock Art, Projectile Points	5500 B.C.	A.D. 200
7309	Projectile Point	A.D. 800	A.D. 1350
7463	Structures	A.D. 800/1000	A.D. 1500
7466	Structure, Projectile Point	A.D. 500	A.D. 1500
7498	Projectile Point	A.D. 1000	A.D. 1750
7548	Structures, Projectile Points	A.D. 200	A.D. 1500
7600	Structures, Projectile Points	A.D. 200	A.D. 1750

Each edge-ground artifact that was collected is described separately below. Each is listed by site, FS, and inventory number. Each is described in terms of material type, attributes, dimensions, and weight.

5LA7303.0.13

This complete specimen is made of medium-grained sandstone and displays two facets on one edge. These bevels are the result of abrasion modification and heavy use wear. The striations are transverse (straight across the bevel) and the use angle is 50 degrees. The facets are straight in planview. It is made on an unmodified cobble that is subrectangular in planview and oval in cross-section. Battering is seen on both edge-ground facets, though it is unknown whether this represents some type of sharpening event or this tool was used to detach flakes from some other object. Secondary mano usage is present on one face of the cobble. The following measurements were taken. Length 129 mm, width 85 mm, thickness 51 mm, lateral edge length (1) 99 mm, lateral edge length (2) 99 mm, lateral edge width (1) 10 mm, lateral edge width (2) 12 mm. The weight is 920 grams.

5LA7309.0.3

This complete specimen is made on a modified fine-grained sandstone cobble. It is irregular in planview and oval in cross-section. It exhibits a single-beveled facet on one edge that is straight in planview and measures 87 mm in length and 14 mm in width. Moderate abrasion wear is seen along the edge, and no battering is present on the facets or ends. This artifact shows secondary usage as a "formal" one-hand mano with heavy wear seen on both faces. The largest face measures 131 mm by 74 mm, and the smaller face is 121 mm by 57 mm. Overall, this specimen measures 145 mm in length, 81 mm in width, 51 mm in thickness, and weighs 878.3 grams.

5LA7325.0.1

This nearly complete specimen is made of fine-grained basalt and displays two facets on one edge. Both facets are the products of heavy usage and not artifact modification. The striations are oriented from 55 to 65 degrees from the long axis. The facets are straight in planview and exhibit heavy polish use wear. It is made on a waterworn cobble that is irregular in planview and oval in cross-section. No secondary mano or hammerstone use is evident. The following measurements were taken. Length 159 mm, width 72 mm, thickness 40 mm, lateral edge length (1) 133 mm, lateral edge length (2) 126 mm, lateral edge width (1) 11 mm, lateral edge width (2) 7 mm. The weight is 724.9 grams.

5LA7401.0.2

This complete artifact is made of hornfels and displays a single straight facet on one lateral edge. The facet is classified as a single bevel showing 75-degree (oblique) striations on a 90-degree working edge. It is made on a cobble that is oval to irregular in form and flattened in cross-section. No secondary mano usage is present. The specimen measures 151 mm in length, 95 mm in width, 34 mm in thickness, and weighs 727.1 grams. The working edge is 113 mm in length and 15 mm in width.

5LA7463.0.3

This complete cobble specimen is made of medium-grained sandstone. It is oval in planview and plano-convex in cross-section. It exhibits double bevels on one edge, and these are straight in planview. Heavy polish wear is seen along the transverse (80°) working edge that was held at an angle of 70 to 80 degrees. The longest bevel measures 108 mm by 13 mm, and the other is 102 mm by 8 mm. Both faces show heavy use wear from secondary mano usage. This specimen measures 139 mm in length, 69 mm in width, 49 mm in thickness, and weighs 722.7 grams.

5LA7463.0.6

This is an edge-ground tool fragment made on an unmodified cobble of fine-grained sandstone. It is oval in planview and flattened in cross section. It exhibits a double-beveled facet on one edge. These bevels are straight in planview and show heavy polish use wear. Transverse striations measure 0 degrees across both facets and these edges were held at 75 to 80 degrees from the object being worked. Secondary mano usage is present on one face, and both ends show distinct battering. The measurements for this incomplete artifact are 72 mm length, 74 mm width, and 27 mm thickness. The weight is 240.6 grams. The remaining measurements for the bevels are length (1) 61 mm, lateral edge length (2) 51 mm, lateral edge width (1) 9 mm, and lateral edge width (2) 5 mm.

5LA7466.0.6

This complete specimen is made on a medium-grained sandstone cobble. The overall shape is oval in planview and cross-section. Modification in the form of grinding is seen along one working edge (straight in planview) with double facets. These working edges were held at 60 and 70 degrees while being worked. Use wear is present in the form of polish and transverse (0-degree) striations on the facet. Secondary mano use is present on both faces and battering is seen on both ends. This specimen is 128 mm in length, 62 mm in width, 38 mm in thickness, and weighs 463.7 grams. The facets measure 117 to 119 mm in length and 6 to 9 mm in width.

5LA7498.0.1.

This complete specimen is made of medium-grained sandstone and displays a single facet on one edge. The facet measures 130 mm in length and 14 mm in width, and is the product of polish use wear and grinding or abrasion modification. The striations are transverse, and the working edge angle is 90 degrees. The facet is straight when viewed from one end. This unmodified cobble is oval to irregular in planview and flattened in cross-section. No secondary mano or hammerstone use is evident. The specimen measures 148 mm in length, 94 mm in width, 43 mm in thickness, and weighs 593.6 grams.

5LA7498.0.2

This complete specimen is made on a modified medium-grained sandstone cobble. It is oval in planview and cross-section. The edges are straight in planview, with one exhibiting a single bevel and one showing a double bevel. The single polished bevel measures 92 mm by 19 mm and shows nearly transverse (80 degree) striations along the 75-degree working edge. The use angles on the double bevel vary from 75 to 85 degrees, with a transverse striation pattern noted on this heavily utilized edge. Heavy battering is seen on both ends and one face. Mano use wear (polish and grinding) is seen on both faces, though it is unclear whether this represents earlier, secondary, or later usage. This specimen measures 147 mm in length, 81 mm in width, 45 mm in thickness, and weighs 877.3 grams.

5LA7530.0.1

This edge-ground tool is made on a modified cobble of medium-grained sandstone. It exhibits a single-beveled facet along one edge that is straight in planview and measures 134 by 15 mm. Heavy abrasion is noted in association with transverse striations along the 65-degree working edge. This artifact shows secondary usage as a one-hand mano (140 by 73 mm), and no ring fractures are visible on the ends or the faces. This nearly complete specimen measures 154 mm in length, 86 mm in width, 51 mm in thickness, and weighs 992.6 grams.

5LA7540.0.2

This specimen is made on an unmodified piece of blocky (tabular) medium-grained sandstone. It appears to be subrectangular in planview and is rhomboid in cross-section. It exhibits an incomplete single-beveled facet (straight in planview) along one edge that measures 87 mm in length and 13 mm in width. Heavy polish use wear and transverse striations are visible along the 50 degree working edge. No secondary mano or hammerstone usage is evident. This broken artifact measures 94 mm in length, 83 mm in width, 28 mm in thickness, and weighs 346.8 grams.

5LA7548.0.1

This complete specimen is made of medium-grained sandstone and displays two thin facets on opposite edges. These bevels are the result of abrasion modification and fairly heavy use wear. The striation pattern for both facets is classified as transverse (straight across the bevel) and the use angle for the working edges is 80 degrees. The facets are straight in planview. This artifact is made on a modified cobble whose final form is oval in planview and plano-convex in cross-section. Battering is seen on both ends and one face. No secondary mano wear is present. The following measurements were taken. Length 175 mm, width 75 mm, thickness 36 mm, lateral edge length (1) 108 mm, lateral edge length (2) 62 mm, lateral edge width (1) 6 mm, lateral edge width (2) 7 mm. The weight is 645.6 grams.

5LA7592.0.2

This specimen is made on a modified cobble of medium-grained quartzite and displays one edge-ground facet along the edge. This facet is the product of fairly heavy usage and some intentional form modification. The striations are visible in multiple

directions (0 to 90 degrees), and the angle in which the tool was held is 90 degrees. The use facet is straight in planview and exhibits abrasion use wear. The parent cobble is oval in both planview and cross-section. No secondary hammerstone use is evident, though mano usage is seen on one face. The length measures 146 mm, width 66 mm, and the thickness measures 43 mm on this complete tool. The weight is 635.6 grams.

5LA7600.0.24

This complete specimen is broken into two pieces which were co-joined for analysis. The parent piece is an unmodified medium-grained quartzite cobble that is oval in both planview and cross-section. It exhibits one double-beveled facet along the edge that is straight in planview and measures 94 mm in length and 7 mm in width on the longest facet. The smaller facet measures 92 mm in length and 8 mm in width. Moderate abrasion and polish use wear is visible, and battering is present on both ends of the artifact. This artifact appears to have been lightly used as a mano, though use wear is difficult to see. Overall, this artifact measures 130 mm in length, 68 mm in width, 38 mm in thickness, and weighs 502.4 grams.

5LA7604.0.2

This complete specimen is made on a medium-grained sandstone cobble. The overall shape is oval in planview and cross-section. Modification in the form of grinding is seen along one working edge (straight in planview) with double bevels. These working edges were held at 60 and 75 degrees during usage. Use wear is present in the form of abrasion and transverse (0-degree) striations on the facets. Secondary mano use is present on both faces, and battering is seen on both ends and the facets. This specimen is 110 mm in length, 76 mm in width, 38 mm in thickness, and weighs 508 grams. The facets measure 76 to 92 mm in length and 6 to 12 mm in width.

5LA7604.0.3

This edge-ground tool is made on an unmodified cobble of medium-grained sandstone. It is oval in planview and irregular in cross-section. It exhibits a single-beveled facet along one straight edge. This edge shows heavy polish use wear and transverse striations across the working edge (used at a 50-degree angle from the object being worked). No secondary mano usage is present; however, both ends show distinct battering. The measurements for this complete artifact are 154 mm length, 81 mm width, and 41 mm thickness. The weight is 689.1 grams. The bevel measurement is 86 mm by 7 mm.

Two-Hand Mano

Though it is generally accepted that two-handed manos are not a class of artifacts found on the PCMS, a single two-hand mano was recorded during field investigations. Because analysis expertise varied among members of the field crew, it is unknown whether this artifact actually fits within the two-hand classification. This artifact is described below.

5LA7303, FS35

This large mano is made from highly consolidated quartzite and is complete. The planview is classified as oval, and two distinct milling facets are present on the faces. Like most of the field-recorded artifacts, the striation pattern was indeterminate, though use intensity is recorded as heavy for both faces. Grinding modification and wear are visible on the faces and both ends show heavy battering. Overall, the length is recorded as 30 cm, the width is 12.5 cm, and the thickness is 5 cm. The largest working face measures 19 x 9 cm and the smaller face measures 16 x 11 cm.

Metates

Metates are artifacts characterized by at least one large grinding surface upon which vegetal foodstuffs or pigments may be crushed or ground with a mano. All of the metates possess attributes that fit them within the Bender (1990) classification. The project metates fall within three basic types of which 86 are slab metates, 68 are basin metates, and seven are bedrock metates. In one highly fragmented specimen the metate class cannot be determined. Material information for the metates is shown in Table 6.7. The metates are primarily made of sandstone (90%), with smaller amounts of quartzite (9%), and basalt (1%). Only 26% if the assemblage is composed of whole artifacts. In those remaining, 53% are smaller than half of the original artifact and 21% are larger than half. Metates were recorded from 69 of the project sites.

Complete metate length (n=39) clusters around 16 to 213 cm (average 59.4 cm), width around 10 to 320 cm (average 55.6), and thickness around 3.5 to 50 cm (average 12.6 cm). The metric data for all complete metates is illustrated in Table 6.8.

Table 6.7. Material Type by Metate Type

Material	Metate Type			
	Slab	Basin	Bedrock	Total
Basalt	0	1	0	1
Quartzite	6	8	0	14
Sandstone	80	60	7	147
Total	86	69	7	162

Table 6.8. Summary Measurement Data for Whole Metates.

Metates						
Variable	Valid Number	Minimum	Maximum	Average	Standand Deviation	Variance
Length	32	16	95	38.7812	19.1028	364.9183
Width	32	10	67	30.1312	14.3897	207.0641
Thickness	15	3.5	32	8.9066	6.8523	46.9549

Note: All measurements in cm.

Slab Metates

These were recorded from 40 separate sites and represent the largest metate class. The majority are made of sandstone (94%), with fewer quartzite (6%) specimens. Eighty percent (n=69) of the assemblage is broken. In the 17 complete specimens, length varies from 20 to 65 cm (average 34 cm), width varies from 10 to 45 cm (average 25.4 cm), and thickness varies from around 3.5 to 32 cm (average 10.1cm). Planview was determined in 94% of the artifacts. Of these, 61 are irregular, 12 are oval, seven are rectangular, and one is square in outline. Only four (2%) of the slab metates have more than one grinding face. Wear and modification is seen as grinding (57%), grinding and battering (42%), or grinding and flaking (1%) in the assemblage. The use intensity is recorded as 55% light, 39% moderate, and 6% heavy. On 84% of the artifacts the striation pattern could not be determined in the field. In the 14 artifacts with visible striation patterns, orientation is longitudinal (n=8), transverse (n=3), circular (n=2), and oblique (n=1).

Basin Metates

A total of 68 artifacts from 38 sites are classified as basin metates. The material types are 87% sandstone, 12% quartzite, and 1% basalt. Only 18 specimens are whole. In the 50 remaining artifacts, 37 are classified as <50% complete and 13 are >50% complete. In the complete specimens, length clusters around 16 to 95 cm (average 42.7 cm), the width clusters 12 to 67 cm (average 33.8 cm), and the thickness clusters 5 to 12.5 cm (average 8.1 cm). No weight data is available.

In 14 (21%) specimens the planview cannot be determined. In those that could be further classified, 21 (31%) are oval, 19 (28%) are irregular, 11 (16%) are rectangular, and three (4%) are square in outline. Use-wear intensity grades from light (38%) to moderate (44%), to heavy (18%). The technology or use wear/modification classifications are 49% ground and pecked, 46% ground, 4% ground and battered, and 1% flaked and ground. Striations were most often longitudinal (12%) in orientation, with circular (6%), multiple (6%), transverse (4%), and oblique (1%) patterns also seen. In 71% of the assemblage, striation patterns could not be determined.

Bedrock Metates

Each bedrock metate is described separately below. Each is listed by Site and Field Specimen number. Each is described in terms of material type, attributes, and dimension.

5LA7277, FS24

This is a single milling surface on a large outcropping of sandstone. This outcrop measures 2.13 x 1.3 x .3 m. The grinding slick (23 x 16 cm) has been modified by surface grinding and exhibits light use wear. The striation pattern cannot be determined.

5LA7537, FS1

This is a flat bedrock slab (1.6 x 1.6 m) with two rounded grinding areas. Both have varnish that is lighter in color than the surrounding rock. Surface A measures 20 by 20 cm and exhibits grinding only. Surface B (25 by 20 cm) is pecked and ground. Light use wear is recorded, though striation patterns could not be discerned.

5LA7537, FS2

This milling slick is located at the edge of a small, sandstone bedrock outcrop (7.5 x 6.5 m). Longitudinal striations and moderate grinding are visible on the 21-x-7-x-1-cm surface that appears oval in planview.

5LA7538, FS53

This is a milling slick exposed on a small sandstone outcrop. This outcrop measures 2.4 m in length and 1.7 m in width. The flat working surface displays light grinding use wear and measures 46 x 35 cm.

5LA7549, FS2

This is a flat (40-x-21-cm) grinding surface located on a large (2-x-2-m) sandstone outcropping. Grinding use wear is recorded, though no distinct striation pattern could be determined macroscopically.

5LA7549, FS2

This shallow basin-like milling surface is located on an exposed 2-by-2-m boulder of sandstone bedrock. Overall, this moderately used slick measures 18 by 10 cm and exhibits distinct grinding with no visible surface pecking.

5LA7604, FS25

This ground area is located on a large 3.2-x-1-x-.5-m chunk of sandstone roof fall that sits within the dripline of a rockshelter (Feature 2). This ephemeral grinding surface measures 30 by 16 cm and shows very light usage.

Miscellaneous Items

Four miscellaneous items were recorded during the 1998 Pinon Canyon Maneuver Site Inventory. This group is composed of two polishing stones and two flat palette-like artifacts. Each tool is listed by site, and FS order, with specimen number listed for collected artifacts. Each is described in terms of tool type, lithic material type, attributes, dimensions, and weight.

5LA7310, FS14 - Palette/Cooking Slab

This complete artifact is made on a thin and unmodified piece of tabular sandstone. Both the top and the bottom faces show heavy wear in the form of grinding, and a red color change or adhesion of some kind is evident on one face. One utilized area measures 14 cm in length and 10.5 cm in width. The larger face measures 15.5 by 11.5 cm. This artifact was analyzed in the field and no weight measurement was taken.

5LA7429.0.5 - Polishing Stone

This broken artifact is made on a flat quartzite cobble. No areas of modification are present, and use wear in the form of heavy polish is seen on one face. It is oval in planview and measures 6.5 x 3 x 1 cm.

5LA7494, FS2 - Palette/Cooking Slab

This is an internal and lateral fragment from a thin sandstone cooking slab or palette. Light wear is seen on one face in the form of grinding, and a red color change or adhesion is present on or in the pore spaces of one face. The remaining portion of this artifact measures 20 x 18 x 1 cm, and use wear is seen on an area measuring 15 x 6 cm

5LA7538, FS59 - Polishing Stone

This is an unmodified cobble of quartzite displaying light grinding and polishing on one face (5 x 45. cm). The planview shape is oval, and the cross-section is recorded as flattened. Some light flaking is seen along one edge; however, this appears to be relatively recent. This complete artifact measures 5 x 4.5 x .2 cm.

Chapter VII: Conclusions

Three hundred and twenty-five previously unrecorded prehistoric sites in the Black Hills were evaluated during the survey. Previously recorded sites that were revisited and re-evaluated are not included in this discussion. Five sites found in the upper reaches of Welsh Canyon, above the Mary Doyle homestead are also excluded from the analysis, as are sites with only historic debris or a predominance of historic debris.

The overwhelming majority of the sites were prehistoric, with only 20 historic sites found in the survey. The dominance of the prehistoric sites in the Black Hills is underscored by the fact that 19 of the historic sites had prehistoric components and a single site, trash from a former sheep or cattle herder's camp, contained only historic trash.

Four historic sites were determined to be eligible for the National Register of Historic Places, and three of these were considered eligible based on the prehistoric components at the sites. One site, 5LA7283, a multi-component site with both prehistoric and historic remains, was eligible based on its historic debris. It is a collapsed homestead or sheepherder's cabin. The walls of the structure collapsed inward and, therefore, we suspect they have covered artifacts that may be important to understanding the site. One of the historic sites, 5LA7507, not considered eligible, is nonetheless an interesting and unusual site. It exhibits the remains of military aircraft that crashed during World War II training.

Of the 319 prehistoric sites evaluated in the Black Hills archaeological survey, 282 were classed as lithic scatters, 15 were rockshelters, nine were cultural material scatters with structure remains, nine were procurement sites, and four were rockshelters with walls or interior structures.

The prehistoric sites in the Black Hills are of interest when compared to sites in other regions of the PCMS. For example, lithic scatter sites in Welsh Canyon constitute 56% of the total sites found, while they make up 88% of the sites in the Black Hills (Loendorf and Loendorf 1999:53). Rockshelters are 26% of the total sites in Welsh Canyon, compared to 4.7% in the Black Hills, and rockshelters with walls in interior structures constitute 5% of the sites in Welsh Canyon compared to 1.3% of the sites in the Black Hills (Loendorf and Loendorf 1999:54). This latter difference should be expected, because the Welsh Canyon survey was in a setting where there were many more rockshelters and overhangs with potential for prehistoric utilization, while the upland open terrain of the Black Hills does not have many outcrops with rockshelters.

A similar comparison can be made for procurement sites where 10% of Welsh Canyon sites were areas where the primary activity was the quarrying of chipped-stone raw material, while only 2.8% of the sites in the Black Hills were classed as procurement areas (Loendorf and Loendorf 1999:56). This difference was also expected because the canyon walls expose more strata that contain potential materials for making stone tools than the flat uplands on the Black Hills.

An interesting comparison is the number of open sites with structures. Three percent of the sites in Welsh Canyon had stone wall structures that were interpreted as the remains of former dwellings, while 2.8% of the sites in the Black Hills had these features (Loendorf and Loendorf 1999:56). The sites in both the Welsh Canyon and Black Hills surveys were classed according to whether they were in a canyon bottom, talus slope, canyon rim, or mesa top type of setting. Of the six prehistoric structure sites recorded in Welsh Canyon, four were on canyon rims or mesa tops and only two were in the canyon bottom setting; while in the Black Hills, nine structures were found along the canyon edges. This produces a total of 13 structure sites in upland settings versus two in the canyon bottom setting. Even though the numbers are not large, this suggests the prehistoric inhabitants who built and used the structures selected upland settings over canyon bottoms. Perhaps this is an observation that was already suspected, but it clearly suggests the Ceramic Stage inhabitants of the PCMS, usually responsible for the structural remains, preferred upland settings for their houses.

Before continuing with additional analysis, it should be clear that the use of surface-collected data has its shortcomings. In the survey, on-site analysis of surface-flaking debris was preformed, or a 150-flake sample of it on large sites, but there are problems with the use of this information. Pressure flakes, for example, which tend to be small, were not seen in the field analysis, and as a result, the measure of chipped-stone tool maintenance is biased. At the same time, American archaeologists are recognizing they cannot collect and take to curation facilities the same amounts of surface debris they did in previous years. This is especially true for large amounts of chipped-stone debitage that is often recognized as having little importance, because there is little temporal control for it.

Recognizing these shortcomings, in the following analysis we have tried to use the data for non-collected surface artifacts as well as collected artifacts to develop patterns of prehistoric use for the Black Hills. Unfortunately, the data for the Welsh Canyon survey were not collected with the same methods and are therefore not comparable. For this reason, the following analyses are biased toward comparing units in the Black Hills with one another. In the future, it should be possible to compare one region of the PCMS with another and hopefully obtain more meaningful results.

In the analysis of the non-collected and collected artifacts found on the Black Hills sites, the survey area was divided into five sub-areas. These areas were arbitrarily established by simply looking at the distribution of the sites and enclosing clusters within areas recognized as having somewhat different settings (Figure 7.1). The criteria for designating the areas was based as much on the geographic settings adjacent to the Black Hills as it was on any actual physiographic difference within the Black Hills. Area I, for example, is located at the west end of the Black Hills where it is situated next to the open steppes that predominate the PCMS, and Area V is on the east end where it overlooks the Purgatoire Canyon. Area IV is along the southern flanks of the Black Hills in tributary canyons that drain into Welsh Canyon. Areas II and III contain large amounts of the flat, open meadows along the top and portions of the northern perimeter of the Black Hills. The distinction between these two latter areas is more subtle than that between the other areas. It was based on the proximity of Area II to the steep-side canyons that drain into Stage Canyon, while the majority of the side drainages in Area III empty into Bent Canyon.

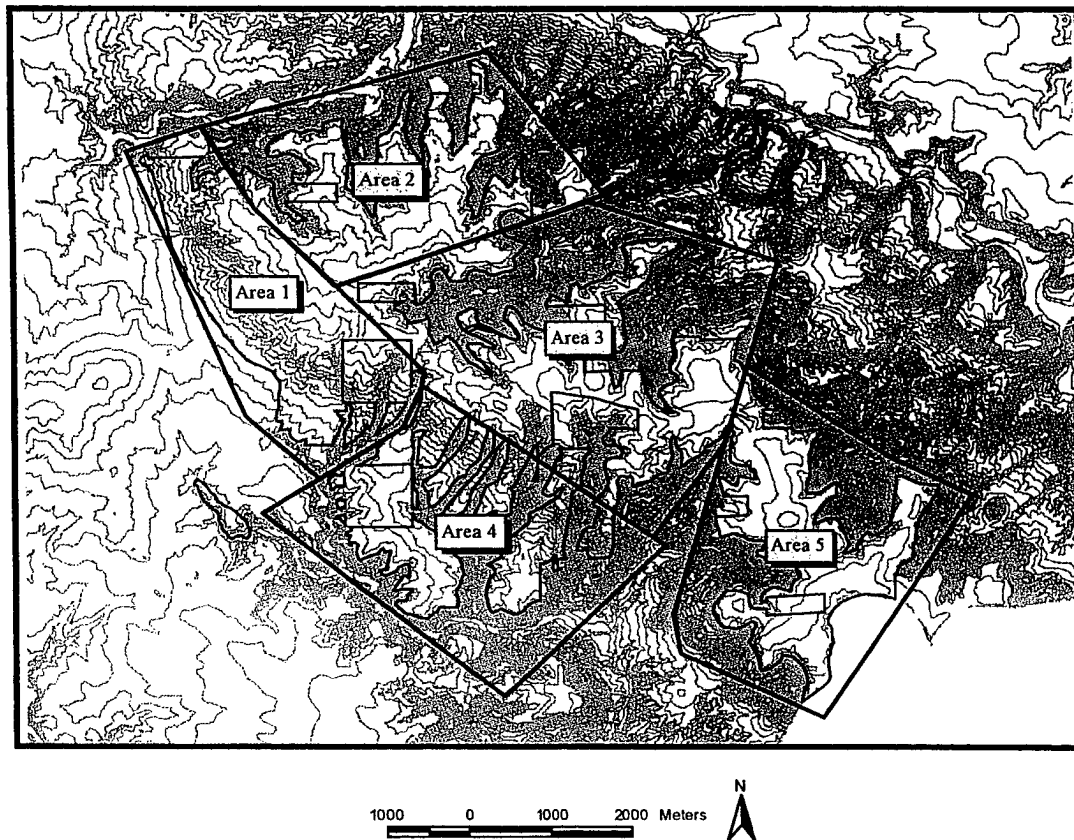


Figure 7.1: Location of the five sub-areas in the Black Hills.

Area I

The dissected western edge of the Black Hills overlooking the steppes to the west is included in Area I. The asymmetrically shaped area includes 6,981 hectares and 103 prehistoric sites. The site density of .015 sites per hectare is the greatest of any of the units.

Area I is dominated by one seed juniper, *Juniperus monosperma*; and black grama grass, *Bouteloua eripoda*, in plant community 21, as defined by Shaw et al. (1989:28). Other common plant species include sagebrush, *Artemisia bigelovi*; common winterfat, *Ceratoides lanata*; small soapweed, *Yucca glauca*; wax currant, *Ribes cereum*; mountain mahogany, *Cerocarpus montanus*; pale wolfberry, *Lycium pallidum*; and skunkbush, *Rhus trilobata*. Piñon pine, *Pinus edulis* is rare in the community. Grasses dominated by grama grasses grow in open areas and are almost non-existent under the juniper canopy. Area I is relatively close to the permanent spring at the head of Stage Canyon at the former Baldwin Ranch.

Sites in Area I include 93 lithic scatters, five rockshelters, one rockshelter with a wall, two cultural material scatters with structures, and two procurement areas. One of the structure sites also has rockshelters that appear to have been extensively used, and this was unusual for structure sites found during the survey.

A total of 5,111 pieces of chipped-stone debitage were analyzed from the sites in Area I, for an average of 49.6 pieces per site. A total of 525 stone tools were found in the area, for an average of 5.1 tools per site.

Thirty of the sites in Area I had ground-stone tools, for an average of 3.1 per site. The number of ground-stone tools for all 103 sites in Area I averages 0.89 tools per site.

Area II

Area II encompasses 8,662 hectares along the northwestern perimeter of the Black Hills. Fifty-five prehistoric sites were recorded in the area, with a site density of .006 sites per hectare. Steep-sided canyons that drain into Stage Canyon dominate the area. The heads of these canyons with occasional water seeps are found in the area where there is access to upper canyon resources.

Area II is primarily in plant community 4, as defined by Shaw et al. (1989:11), with some areas in plant community 21 described above. Plant community 4 is found along the upland meadow edges of the Black Hills that are dominated by grama grasses. Other shrubs in plant community 4 include sagebrush, soapweed, and bushy eriogonum, *Eriogonum effusum*.

Forty-six of the 55 sites in Area II are lithic scatter sites. Five are rockshelters, one is a rockshelter with a wall, two have prehistoric structures on them, and one was identified as a procurement site. The total number of flakes analyzed in the area is 2,001, for an average of 36.4 flakes per site. One hundred and sixty-eight tools were found on the sites, for an average of 3.1 tools per site.

Seventy-one ground-stone tools were found on 20 sites, with an average of 3.6 pieces per site, while the average number of ground-stone tools is 1.29 for the 55 sites in the area.

Area III

Area III is the largest of the units, enclosing an area of 13,341 hectares. With 59 sites in the unit, the area has the smallest site density of .004 sites per hectare. These sites include 51 lithic scatters, one rockshelter, two rockshelters with walls, two structure sites, and three lithic procurement sites.

Area III is situated near Sugarloaf Spring to the north of the Black Hills. It includes the flat upland areas near the spring as well as the heads of canyons and some steep sides from canyons that drain into Bent Canyon. The vegetation is in plant community 4, as described above, with about equal areas of plant community 21, as well.

The total number of chipped-stone flakes found in Area III was 2,316, with an average of 39.3 flakes per site. A total of 188 chipped-stone tools were identified, for an average of 3.2 tools per site.

Ground-stone tools were found on 23 sites. The 75 manos and metates constitute an average of 3.3 tools per site and 1.27 tools for the 59 sites in the area.

Area IV

Area IV is an elongated area along the southern boundary of the Black Hills adjacent to Welsh Canyon. The terrain includes the heads and middle reaches of the side canyons that slope into Welsh Canyon as well as the upland ridges that separate these canyons. Most of this area is in the upper part of Welsh Canyon, where the side canyons are not extremely deep, and access to and from the top of the Black Hills is relatively easy.

Plant community 21, as described above, dominates the vegetation with areas on the ridges in plant community 4. Areas with abundant Indian rice grass were noted during the survey.

Area IV encompasses 8,095 hectares. The 34 sites in the area make up an average of .004 sites per hectare. Twenty-nine of the sites are lithic scatters, one had a rockshelter, and no rockshelters with walls were found. Two structure sites were recorded, as were two lithic procurement sites.

A total of 2,276 pieces of flaking debitage were recorded in the area, with an average of 66.9 pieces per site. Seventy-nine chipped-stone tools were found in the area, for an average of 2.3 tools per site.

Ground-stone tools were found on 15 sites, with 63 manos or metates from those sites. This is an average of 4.2 tools per site. The average for all the sites found in the area is 1.85 pieces of ground stone on the 34 sites.

Area V

Area V is composed of 9,014 hectares. It is found along the top of the Black Hills on their eastern end. The area drains into Bent Canyon along the north, into Welsh Canyon along the south, and into the main Purgatoire Canyon along the east. Edges are steep, and access to bottomland areas is limited. At the same time, the access to the resources near the canyon rims, like some lithic procurement areas, is good.

The primary vegetation is in the upland plant community 4. Piñon pines are significantly more abundant in Area V than any of the other areas in the Black Hills. Juniper is also common along the edges where plant community 21 apparently terminates along its upper slope.

A total of 68 prehistoric sites were recorded in the area, for an average of .008 sites per hectare. Sixty-three of the sites are lithic scatters, two are rockshelters, two are structure sites, and a single site is a procurement area. No rockshelters with walls were found. A total of 3,801 flakes were recorded during the research. These average 56.2 flakes per site. The total of 265 chipped-stone tools was the second highest in the Black Hills. This averages 3.9 tools per site.

Sixty-nine manos or metates were found on 16 sites, for an average of 4.3 tools per site. The average number of ground-stone tools for all the sites in Area V is 1.02 per site.

Summary

Subdividing the Black Hills into smaller units for analysis allows for some generalizations regarding the prehistoric sites. The most obvious conclusion is that Area I, the smallest of the units, contains the greatest number of sites per hectare, the greatest number of tools per site, and although Area V has more flakes per site, the number of tools to flakes is higher in Area I (Table 7.1). The comparison of Area IV to Area I is worth noting. Both areas are found along the south side of the Black Hills, but the ratio of tools to flakes is more than twice as great in Area I as it is in Area IV. At the same time, this ratio is about the same for the areas on top of the Black Hills, a fact that further emphasizes the difference between Area I and Area IV. There is no certain explanation for this difference. At first glance, we might argue that the location of Area I in a region where there is excellent access to the steppes and the resources found on them is the most logical reason. Area IV is adjacent to the upper reaches of Welsh Canyon, and these edges do not contain the amounts of edible grasses like Indian rice grass or sunflowers common to the high steppes.

Table 7.1: Prehistoric Site Data for the Five Sub-areas in the Black Hills.

Prehistoric Site Data	Area Number				
	Area I	Area II	Area III	Area IV	Area V
Size in Hectares	6981	8662	13341	8095	9014
Number of Sites	103	55	59	34	68
Total # of Chipped-Stone Flakes	5111	2001	2316	2276	3801
Avarage # Flakes Per Site	49.6	36.4	39.3	66.9	56.2
Total # of Stone Tools	525	168	188	79	265
Total # of Ground-Stone Tools	92	71	75	63	69
Total # of Sites with Ground Stone	30	20	23	15	16
Average # of Ground-Stone Tools Per Site	3.1	3.6	3.3	4.2	4.3
Multiple Component Sites	10	3	3	1	3
Average # of Ground Stone for all Sites	0.89	1.29	1.27	1.85	1.02
Ratio of Flakes to Chipped-Stone Tools	9.70	11.9	12.3	28.8	14.3
Ratio of Chipped-Stone Tools to Ground-Stone Tools	5.77	2.37	2.51	1.25	3.84
Ratio of Bifaces (Projectile Points) to Ground-Stone Tools	1.80	0.57	0.82	0.60	1.04

The use of the current plant communities as a guide to understanding the prehistoric plant communities may not be very adequate. Cattle and sheep have had an effect on the plants, as evidenced by new growth of cottonwoods in the years since grazing ended in the PCMS. Other plants that are obviously affected include sunflowers, which were extremely abundant in 1998, and although some of this growth can be attributed to increased precipitation, there is little doubt that the absence of livestock grazing played an important role in their abundance.

In this case, we might argue that the reason there are more tools to flakes in Area I is the proximity of the steppes for collecting plants, like sunflowers or Indian rice grass. However, the number of ground-stone tools in Area I compared to Area IV is considerably less. Area I sites have .89 ground-stone tools per site for all the sites and 3.1 per site for the sites with ground-stone tools. Area IV has 1.85 ground-stone tools for all the sites and 4.2 tools per site for the sites with ground stone. This difference suggests the former occupants of Area IV may have been processing more seed plants than the occupants in Area I. Furthermore, it makes the hypothesis that plant processing was an important activity in Area I a debatable solution to the difference.

If the explanation for the difference is not related to plant procurement, perhaps it is related to access to game animals. The flat, grass-covered steppes may have been an abundant area for animals like antelope and bison, especially important resources that were hunted from a setting on the edge of their territory. Other game animals like rabbits were probably about equal in both areas. Deer were also found in both areas, and although they may have been easier to hunt in Area IV, deer tend to hide out on the broken terrain adjacent to flat areas. Thus, access to antelope, bison, and deer may have been especially favorable from the edges of the steppes.

If the solution to the difference in the tools between the two areas is related to hunting of larger animals, then abundant projectile points, knives, and scrapers should be expected in Area I. These are the sorts of tools needed to kill and process big-game animals, and fewer plant-processing tools might be expected as well. In particular, the number of plant-processing tools should be lower than the number of tools associated with animal processing.

The latter is clearly correct. Area I sites have two plant-processing tools for every 10 chipped-stone tools, and Area IV sites have eight plant-related tools for every 10 tools related to animals. Areas II and III have about four plant-processing tools per 10 chipped-stone tools, while Area V has a ratio of about 2.6 plant-processing tools to 10 chipped-stone tools.

It can be argued that the number of chipped-stone tools used for working wood or processing plants rather than killing or processing animals introduces a bias to the ratio. To remedy the potential error, the ratio of ground-stone tools to projectile points was calculated. Almost certainly, the projectile points in classes one and two of the analysis were primarily hunting tools. Some may have also been used in warfare, but very few of the sites in the Black Hills appear to have been fortified or situated in defensive locations. A few sites break this model, like 5LA7307 in Area II, which is set on a narrow point at the junction of several canyons with precipitous walls. The only access to the site is via the narrow ridge between two canyons on one side of the site. Site 5LA7307 is not the norm, however, and most of the sites in the Black Hills are not in good defensive positions.

It is believed that the majority of the projectile points on the sites in the Black Hills were made and used for hunting, and the ratio of projectile points to ground-stone tools is a direct measure of the emphasis on hunting versus plant gathering and processing.

Area I Summary

The use of Area I was dominated by mixed hunting and gathering, with a definite emphasis on hunting throughout the prehistoric period. Projectile points from the area range in age from the late Paleo-Indian period to the Protohistoric period. Ten sites with diagnostic artifacts that indicate multiple periods of use were recorded in Area I. Areas II, III, and V each had three of these kinds of sites, while Area IV had only one. This means that Area I, the smallest of the five areas used in the analysis, had as many multicomponent sites as the other four areas together. Clearly the northwestern end of the Black Hills, adjacent to the steppes, was a popular place for hunters throughout the prehistoric period.

Area II Summary

Surface artifacts from Area II suggest an economy of mixed hunting and gathering, with about equal emphasis on both practices. The surface tools do not allow us to identify any breaks in this pattern, which was apparently in use from the Early Archaic period through the Late Ceramic period. Three sites in the area had diagnostic projectile points suggesting multiple periods of use. Although it was used considerably less than Area I, it suggests the area was moderately popular through time.

Area III Summary

Surface artifacts in Area III suggest a prehistoric use much like that of Area II. Tool types, average numbers of ground-stone tools on the sites, the ratio of flakes to tools, and the ratio of ground-stone tools to chipped-stone tools is very similar in both areas. Three multicomponent sites were also found in Area III. Apparently the main use of Area III was also mixed hunting and gathering with equal emphasis on both food pursuits.

Area IV Summary

Area IV differs from all the other areas in the analysis in the number of ground-stone tools per site, and the ratio of ground-stone tools to chipped-stone tools is the highest of all the areas. The area also has a lower flake to chipped-stone tool ratio than other areas. Only a single site in Area IV has evidence of multicomponent use. This is one of the significant differences between Area IV and Area I, but the two areas differ more than any others in the study. The tools suggest that Area IV was used more for plant collection and processing than any of the other areas, and in this regard the activities are in direct contrast to those in Area I, where hunting was the primary activity.

Area V Summary

Activities recognizable from surface artifacts in Area V are the least consistent of the study. Some indicators suggest hunting was dominant, while others indicate gathering was of primary importance. Piñon pine is the most abundant in Area V, and one might expect a heavy ratio of ground-stone tools to chipped-stone tools, but the ratio is actually 2.5 ground-stone tools to 10 chipped-stone tools. This is the second lowest ratio in the Black Hills and a fairly good indicator that the primary activity in Area V was not plant processing. It is also clear that if manos and metates were used in processing Piñon nuts in the area, it is not recognizable from the surface artifact distribution.

The numbers of chipped-stone tools in Area V is greater than expected, and although the most expedient explanation is to suggest these tools reflect an emphasis on hunting, there is another solution to the problem. Area V is in the best position to obtain the quartzite found in the lower reaches of Welsh Canyon, Bent Canyon, and the Purgatoire Canyon.

Perhaps the high number of chipped-stone tools reflects procurement in the canyons and reduction of the materials into preforms or blanks for future use. If this pattern of procurement and tool production were actually the case, then there should be evidence for early-stage percussion lithic reduction in Area V. Using the plot for all the sites in the Black Hills, the percent of small cortical quartzite flakes is 26% and small cortical chert flakes is 18% of the flaking detritus (Figure 7.2).

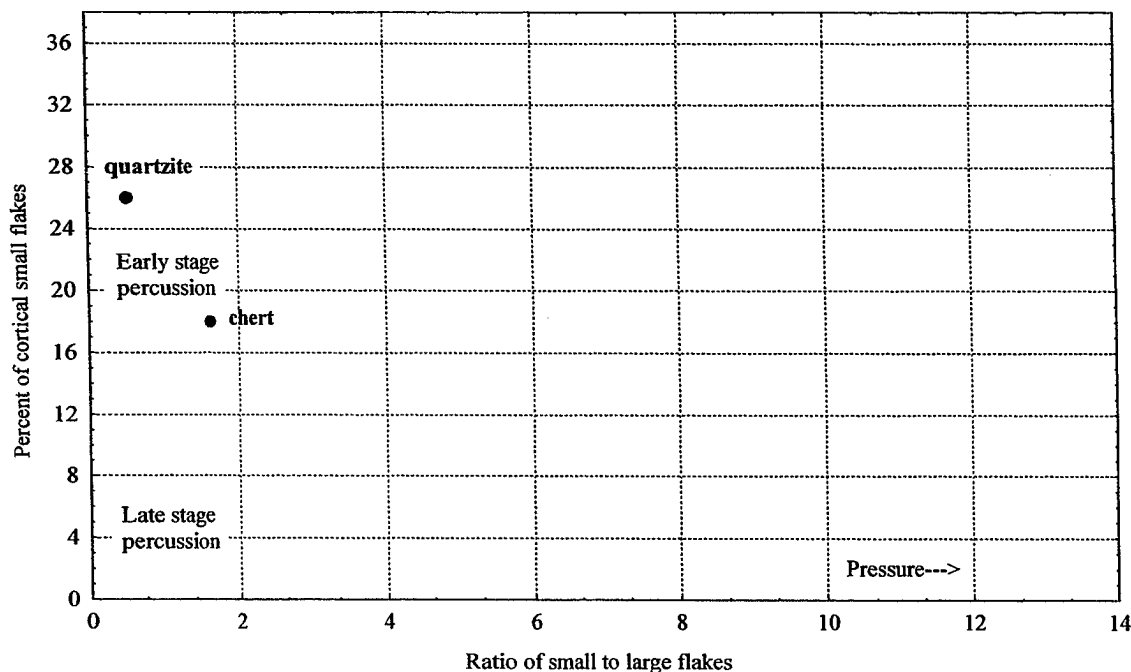


Figure 7.2: Scatter plot of quartzite and chert early-stage percussion flakes for the Black Hills sites.

Area V has a quartzite percentage of 31.8%, nearly 6% higher than the average for all the Black Hills sites. Chert has a percentage of 22%, as compared to the 18% for the rest of the Black Hills sites. These numbers strongly suggest the eastern end of the Black Hills was an area where early-stage percussion lithic reduction was an important activity and chipped-stone cores were frequently reduced to make preforms or other portable pieces of chipped-stone material.

The division of the Black Hills survey area into sub-units for additional analyses produced some relatively meaningful results. Using these data, it should be possible to construct sampling strategies for comparison with other regions of the PCMS. For example, the edges of hills that overlook the steppes should contain sites with large numbers of artifacts associated with hunting. Use of the chipped-stone analysis, completed in the field, allows us to distinguish sites (or areas) that were apparently used for procurement and stone tool manufacture. Without the field studies of the debitage, these differences would have been more difficult to detect.

The comparison of ground-stone tools to projectile points also has the potential to offer useful comparative information about sites and regions of the PCMS. As future areas are studied, we should be able to locate regions where plant collection and processing was the paramount activity.

In conclusion, the use of the chipped-stone tool, chipped-stone debitage analyses, and ground-stone analysis forms in the field portion of the project was a success. As the database increases, it will be possible to make a number of meaningful statements about the differential use of the PCMS by the hunting and gathering cultures that used it in the past.

BIBLIOGRAPHY

Ahler, Stanley

- 1989a Mass Analysis of Flaking Debris: Studying the Forest Rather than the Tree. In *Alternative Approaches to Lithic Analysis*, edited by D.O. Henry and G.H. Odell, pp. 85-118. Archaeological Papers of the American Anthropological Association No. 1.
- 1989b Experimental knapping with KRF and midcontinent cherts: overview and applications. In *Methodological Contributions to Lithic Analysis*, edited by D.S. Amick and R.P. Mauldin. BAR International Series.
- 1996 Redefinition of Chipped Stone Lithic Raw Material Types. In *Archaeological Investigations at Ceramic Stage Sites in the Pinon Canyon Maneuver Site, Colorado*, pp. 339-355. Contribution No. 308. Department of Anthropology, University of North Dakota, Grand Forks. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-0-PO18.

Ahler, Stanley, and Robert Christensen

- 1983 *A Pilot Study of Knife River Flint Procurement and Reduction at Site 32DU508, a Quarry and Workshop Location in Dunn County, North Dakota*. Contribution No. 186. Department of Anthropology, University of North Dakota, Grand Forks.

Anderson, Jane L.

- 1985 Chronological Framework. In *Chronological Framework of the Fort Carson-Pinon Canyon Maneuver Site, Las Animas County, Colorado*, edited by Christopher Lintz, pp. 14-52. U.S. Army Fort Carson-Pinon Canyon Cultural Resource Project, Contribution No. 2. Center for Archaeological Research, Denver University, Denver. Submitted to USDI National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX 1200-3-A021.
- 1989 Projectile Points. In *Temporal Assessment of Diagnostic Materials from the Pinon Canyon Maneuver Site*, edited by Christopher Lintz and Jane L. Anderson. pp. 111-316. Memoir No. 4. Colorado Archaeological Society.
- 1990 Prehistoric Overview. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado*, edited by William Andrefsky, Jr., pp. VII-1 – VII-31. Larson-Tibesar Associates, Laramie, Wyoming, and Centennial Archaeology, Fort Collins, Colorado. Submitted to the National Park Service, Denver.

Andrefsky, William, Jr. editor

- 1990a Analysis of Chipped Stone Artifacts from PCMS: An Introduction to Chipped Stone Analysis. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado*, edited by William Andrefsky, Jr., pp. IX-1 – IX-7. Larson-Tibesar Associates, Laramie, Wyoming, and Centennial Archaeology, Fort Collins, Colorado. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-7-BO54.

1990b Prehistoric Site Type Analysis. In *An Introduction to the Archeology of Pinon Canyon, Southeastern Colorado*, edited by W. Andrefsky, Jr., Vol. 1, chapter XIV. Larson-Tibesar Associates, Laramie. Submitted to the National Park Service, Rocky Mountain region, Interagency Archeological Services, Denver. Contract No. CX 1100-7-BO54. NTIS Accession No. PB90-192105.

1990 *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado*. 6 vols. Larson-Tibesar Associates, Laramie, Wyoming, and Centennial Archaeology, Fort Collins, Colorado. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-7-BO54.

1994 Raw-Material Availability and the Organization of Technology. *American Antiquity* 59(1):21-34.

Andrefsky, William, Jr., Marilyn J. Bender, John D. Benko, and Judy K. Michaelse

1990 *Test Excavations in the Pinon Canyon Maneuver Site, Southeastern Colorado*. 2 vols. Larson-Tibesar Associates, Laramie. Submitted to the National Park Service, Rocky Mountain Region, Interagency Archeological Services, Denver. Contract No. CX 1200-7-B054. NTIS Accession No. not yet assigned.

Antevs, Ernst

1955 Geologic and Climatic Dating in the West. *American Antiquity*, 20(4):317-335.

Bender, Marilyn J.

1990 Groundstone Analysis. In *An Introduction to the Archaeology of Pinon Canyon*, edited by W. Andrefsky, Jr., pp. X-1—X-61, Vol. II. Larson-Tibesar Associates, Laramie. Submitted to the National Park Service, Rocky Mountain Region, Interagency Archeological Services, Denver. Contract No. CX 1100-7-B054. NTIS Accession No. PB90-192105.

Bryson, R.A., Baerris, D.A., and W.M. Wendland

1970 The Character of Late-Glacial and Post-Glacial Climatic Changes. In *Pleistocene and Recent Environments of the Central Great Plains*, edited by W. Dort and J.K. Jones, pp. 53-74. University Press of Kansas, Lawrence.

Butler, William

1986 *Taxonomy in Northeastern Colorado Prehistory*. Ph.D. Dissertation. University of Missouri, Columbia. University Microfilms, Ann Arbor, Michigan.

1988 The Woodland Period in Northeastern Colorado. *Plains Anthropologist* 33 (122): 449-465.

Campbell, Robert Gordon

1969 *Prehistoric Panhandle Culture on the Chaquaqua Plateau, Southeastern Colorado*. Ph.D. Dissertation, University of Colorado, Boulder. University Microfilms, Ann Arbor, Michigan.

Carrillo, Richard F.

- 1990 Historic Overview. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado*, edited by William Andrefsky Jr., pp. XVIII-1- XVIII-42, Vol. III. Larson-Tibesar Associates, Laramie, Wyoming, and Centennial Archaeology, Fort Collins, Colorado. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-7-BO54.

Chomko, S.

- 1997 Stone Structures Do Not a Permanent House Make. Paper presented at the 62nd Annual Meeting of the Society for American Archaeology, Nashville.

Cotterell, B., and J. Kamminga

- 1987 The Formation of Flakes. *American Antiquity* 52:675-708.

Darroch, John I.

- 1974 *Edge-ground Cobbles: A Discussion*. Archaeology in Montana, Vol. 15, No. 2, Missoula.

Dean, J. Claire

- 1992 *Guidelines to the Regional Procedures for Archaeological Field and Laboratory Work at the Pinon Canyon Maneuver Site, Las Animas County, Colorado*. MS submitted to the U.S. Army by the Department of Anthropology, University of North Dakota, Grand Forks.

Evanoff, E.

- 1998 *Results of the Field Study of the Surficial Geology and Paleontologic Resources of the Pinon Canyon Maneuver Site, Las Animas County, Colorado*. University of Colorado Museum, Boulder. Report submitted to the Midwest Archaeological center, National Park Service, Lincoln, Nebraska.

Friedman, Paul D.

- 1985 *History and Oral History Studies of the Fort Carson Pinon Canyon Maneuver Area, Las Animas County, Colorado*. Powers Elevation, Denver. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-3-AO66.

Frison George

- 1974 *The Casper Site: A Hell Gap Bison Kill on the High Plains*. Academic Press, New York.

Gunnerson, J. H.

- 1989 *Apishapa Canyon Archaeology: Excavations at the Cramer, Snake Blakeslee and Nearby Sites*. Reprint in Anthropology Vol. 41. J and L Reprint, Lincoln, Nebraska.

Hanson, Jeffery R., and Sally Chirinos

- 1989 Ethnohistory. In *Nine Rock Art Sites in the Pinon Canyon Maneuver Site, Southeastern Colorado*. by L.L. Loendorf, pp. 18-37. Contribution No. 248. Department of Anthropology, University of North Dakota, Grand Forks. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX 1200-7-BO61.

Haury, Cherie E.

1989a History. In *Nine Rock Art Sites in the Pinon Canyon Maneuver Site, Southeastern Colorado*. by L.L. Loendorf, pp.38-45. Contribution No. 248. Department of Anthropology, University of North Dakota, Grand Forks. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX 1200-7-BO61.

1989b Prehistory. In *Nine Rock Art Sites in the Pinon Canyon Maneuver Site, Southeastern Colorado*. by L.L. Loendorf, pp.7-17. Contribution No. 248. Department of Anthropology, University of North Dakota, Grand Forks. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX 1200-7-BO61.

Hummer, Anne G.

1989 Prehistoric Ceramics. In *Temporal Assessment of Diagnostic Materials from the Pinon Canyon Maneuver Site*, edited by Christopher Lintz and Jane L. Anderson. pp. 316-374. Memoir No. 4. Colorado Archaeological Society.

Johnson, Claudia C.

1984 *The Geologic Assessment of the Pinon Canyon Archaeological Project Site Southeastern Colorado*. University of Colorado. Submitted to Mark Guthrie, University of Denver.

Kalasz, Stephen M.

1989 Prehistoric Architectural Remains. In *Temporal Assessment of Diagnostic Materials from the Pinon Canyon Maneuver Site*, edited by Christopher Lintz and Jane L. Anderson. pp. 86-110. Memoir No. 4. Colorado Archaeological Society.

Lintz, Christopher

1984 *Architecture and Community Variability Within the Antelope Creek Phase of the Texas Panhandle*. Ph.D. Dissertation, University of Oklahoma, Norman. University Microfilms, Ann Arbor, Michigan.

Lintz, Christopher, and Jane Anderson

1989 *Temporal Assessment of Diagnostic Materials from the Pinon Canyon Maneuver Site*. Memoir No. 4. Colorado Archaeological Society.

Loendorf, L.L., J.L. Borchert, and D.G. Klinner

1996 *Archaeological Investigations at Ceramic Stage Sites in the Pinon Canyon Maneuver Site, Colorado*. Contribution No. 308. Department of Anthropology, University of North Dakota, Grand Forks. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-0-PO18.

Loendorf, Lawrence, and Christopher Loendorf

1999 *Archaeological Sites in Welsh Canyon, Las Animas County, Colorado*. Report submitted to the Midwest Archeological Center, National Park Service, Lincoln, Nebraska.

McFaul, M. and R.G. Reider

1990 Environmental Setting: Physical Environmental Geoarchaeological Investigations. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado*, Vols. 2 and 3, edited by W. Andrefsky Jr., pp. 1-13 and 1-30. Larson Tibesar Associates, Laramie Wyoming and Centennial Archaeology, Fort Collins, Colorado. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-7-BO54.

McNeish, R. S.

1964 Ancient Mesoamerican Civilization. *Science* 143:531-537.

Schiavitti, Vincent, Lawrence Loendorf, and Erica Hill

1999 *Archaeological Investigations at Eleven Sites of Welsh Canyon in the Pinon Canyon Maneuver Site, Las Animas County, Colorado*. Submitted to the Midwest Archeological Center, National Park Service, Lincoln, Nebraska.

Scott, Linda

1984 Preliminary Report of the Pollen, Microfloral and Fiber Analyses, at Pinon Canyon, 1983 Field Season. In *The Fort Carson-Pinon Canyon Project: Interim Management Report*, compiled by T. Pozorski and M. Guthrie, Appendix III. Archaeological Research Institute, University of Denver. Submitted to the National Park Service, Interagency Archeological Service, Denver.

Schuldenrein, J. D., M. Helgren, H. E. Jacson and A. Pitty

1985 *Geomorphological and Geoarchaeological Investigations at the U. S. Army Fort Carson-Pinon Canyon Maneuver Site, Las Animas County, Colorado*. Gilbert/Commonwealth, Jackson Michigan. Submitted to the National Park Service, Rocky Mountain Regional Office, Denver, Contract No. CX-1200-3-AO64.

Shaw, R.B., S.L. Anderson, K.A. Schultz, and V.E. Diersing

1989 *Plant Communities, Ecological Checklist, and Species List for the U.S. Army Pinon Canyon Maneuver Site, Colorado*. Science Series No. 37. Department of Range Science, Colorado State University. Submitted to the U.S. Army Corp of Engineers, Engineering and Housing Support Center.

Stoffle, Richard, H.F. Dobyns, M. J. Evans, and G.C. Steward

1984 *Toyavita Plavuhuru Koroin, "Canyon of Mother Earth": Ethnohistory and Native American Religious Concerns in the Fort Carson-Pinon Canyon Maneuver Area*. University of Wisconsin—Parkside, Kenosha, Wisconsin.

Appendix I: Non-Eligible Site Descriptions

prepared by:

Lawrence Loendorf

5LA7265

The site consists of a relatively sparse scattering of lithic artifacts that largely occurs around a small sandstone outcrop. Flaking debris has the following material type distribution -- quartzite (24), chert (11) and quartz (1). Two temporally diagnostic projectile points were collected from the site. One of these specimens (5LA7265.0.1) resembles Anderson's (1989) P37 type, which has associated dates that extend from A.D. 850 to A.D. 1100 (Figure 1). The second projectile point (5LA7265.0.2) is similar to the P35 type, which has associated dates of 1000 B.C. to A.D. 1200. A quartzite biface with use wear (nibbling and crushing), a quartzite uniface, and a chert side scraper were observed but not collected. The site has an usually high density of retouched tools. The site was found early in the survey and before the lithic collection strategy was in place. We did not return to the site to complete more intensive collecting because it is not significant and not a good candidate for additional research.

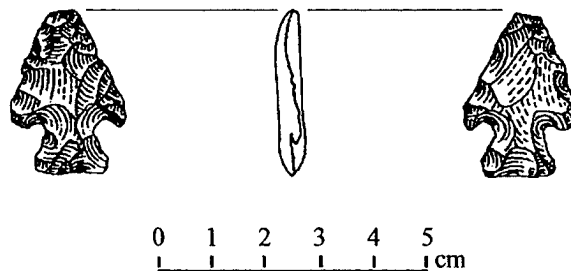


Figure 1: P37 projectile point from the surface of 5LA7265.

5LA7266

The site consists of a small concentration of lithic artifacts that is located immediately south of a previously recorded lithic scatter. Only approximately 40 m separates the two sites, and it is possible that they are portions of the same general scatter. The 14 flakes examined on this site include 11 of chert and three of quartzite. Two projectile points that are difficult to type, but may be Late Archaic styles, were collected. A third biface that is probably a point fragment was also collected. No evidence of former fire features was noted. Soils are poorly developed, and the site is not considered to be a good candidate for additional research.

5LA7267

The site consists of a concentration of flakes with a few scattered flakes surrounding. No diagnostic artifacts were located. Some scattered heat-altered stone was observed in the area of lithic concentration. Surface visibility was good at the time of the site's recording. Flaking debris is made of quartzite (15), argillite (2), chert (2), basalt (2), and quartz (1). This diversity in such a small number of flakes is unusual for other areas of the PCMS. A chert non-bipolar

core was noted in the site surface detritus. Additional research is not warranted for the site.

5LA7268 - This is an eligible site; for a full description see Chapter III.

5LA7269

The site is composed of four artifact clusters. Cluster 1, measuring 33 m north-south, is a very sparse lithic scatter located on a sloping knoll which is sloped down to the east. Cluster 2, measuring 3 x 2 m and located on top of a knoll, is three artifacts with a chert (black) biface preform. Cluster 3 slopes on exposed bedrock west of Cluster 2. It is a sparse scatter of five flakes. It measures 9 x 4 m. Cluster 4 is located across a small drainage north of Cluster 2. It consists of seven flakes tightly clustered in a deflated area. The 17 flakes analyzed in the field are made of quartzite (10), chert (6), and argillite (1). Two quartzite retouched flakes and a quartzite non-bipolar core were recorded in the surface debris. Most of the artifacts are resting on a thin layer (3-5 cm) of soil on the bedrock. The site is located 150 m north of 5LA7268. A 50 cal. cartridge (1943?) was found. Some deposits are perhaps 10-20 cm deep, with bedrock outcrops all around and within the site, but the site is not considered a good candidate for additional research.

5LA7270 - This is an eligible site; for a full description see Chapter III.

5LA7271

The site consists of a very sparse scatter of lithics that is located along the upper edge of an unnamed side drainage of Stage Canyon. A quartzite biface fragment (non-diagnostic) that is possibly a portion of a projectile point was identified. Flaking debris analyzed on the site consisted of two quartzite flakes that, along with the tool, constituted a site. No additional research is recommended for this small lithic scatter.

5LA7272

The site is a diffuse lithic scatter located on gently sloping terraces near the top of a ridge. The site assemblage consists of nine flakes, one retouched/utilized flake, and one biface fragment. Material types for the flakes are quartzite (6), chert (2), and one quartz specimen. The retouched/utilized flake is made of quartzite, and the biface fragment may be Alibates chert. The cultural deposits at the site are less than 10 cm deep and are disturbed by wind erosion. No additional research is recommended for the site.

5LA7273

The site is a diffuse lithic scatter located on a small terrace below a ridge that slopes down to the west. Eleven quartzite flakes, one chert flake, and one basalt flake were noted on the surface, along with six tools. This is a relatively high tool-to-debitage ratio. A well-made quartzite corner-notched projectile point (Type P35) suggests either a Late Archaic or Ceramic stage occupation (Figure 2). Other tools include another fragment of a quartzite biface; two end-

or side-scraping tools, one of quartzite and the other of chert; an argillite retouched and perhaps utilized flake; and a large, crude quartzite bifacial core/tool.

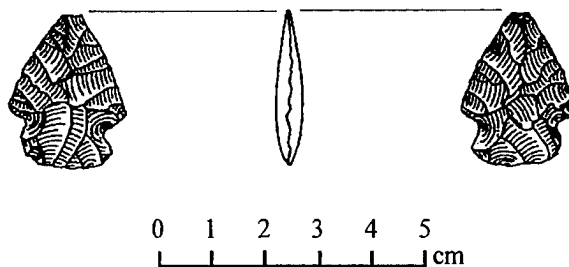


Figure 2: P35 projectile point recovered from the surface of 5LA7273.

The site measures 28 x 35 m. A small cluster of tools was located about 14 m southwest of the site datum. This cluster is located in a small deflated area, and it suggests there may be other areas of buried cultural remains on the site. In the absence of fire features, however, the site is not considered worthy of additional research.

5LA7274

The site consists of a sparse scatter of lithics. An obsidian biface and an obsidian flake were located. Other flaking debris includes quartzite (11), chert (3), and chalcedony (1) materials. The site is relatively small, measuring less than one-third acre in size. Despite this and the small number of flakes, six tools were recorded. One of these was a quartzite non-bipolar core; another was a crude quartzite bifacial core-tool; there were also two retouched flakes, one of quartzite and the other of chert. The most interesting tools include two projectile points made of obsidian. Only one of these (5LA7274.0.5) is classifiable and conforms to Anderson's (1989) P61 type. Obsidian from the site was analyzed and found to be from sources in the Jemez Mountains of New Mexico, suggesting a contact between the site occupants and that area.

Unfortunately the site does not have any areas where investigators thought there might be intact cultural remains. The absence of any evidence for former fires on the site is also not a good indicator that it will produce significant cultural materials, if excavated. No additional research is recommended for the site.

5LA7275

The site consists of a sparse scatter of six chert flakes. A historic fence line is located along the eastern boundary of the site. An end/side scraper was collected. The site is small, no features were found, and there are no areas that the investigators thought would produce intact remains through excavation. No additional research is recommended.

5LA7276

The site consists of a very sparse scatter of lithics in the bottom of an unnamed side drainage of Welsh Canyon. Three quartzite flakes and an end scraper were collected from the site. No features were noted. The site does not have well-developed soils, and there do not appear to be areas where buried remains might be located. No additional research is planned.

5LA7277 - This is an eligible site; for a full description see Chapter III.

5LA7278

The site consists of a very sparse scatter of lithics (5) and a side-notched projectile point. Material types include quartzite (3), basalt (1), and chert (1). The site is located on the southern edge of a small east-west-trending drainage. The side-notched projectile point (5LA7278.0.1) is classified as a P45 type and dates to the Archaic. It is made of chert, but the material type is also similar to some quartzites. No features were found on the site. Soils are thin, and the site is not expected to contain intact cultural remains. No further work is recommended.

5LA7279

The site consists of a very sparse scatter of lithics on the upper edge of an unnamed side drainage of Stage Canyon. Five quartzite and a single obsidian flake were found. The obsidian was not submitted for sourcing. Two retouched quartzite flakes were recovered, but no other cultural remains are found and the site is not significant.

5LA7280

The site consists of a relatively sparse scatter of lithics on the top of a ridge between two unnamed side drainages of Stage Canyon. A biface fragment that may be a mid-section of an Archaic point, made of hornfels/basalt, was collected. A chert end scraper and a retouched flake were also collected. Flaking debris on the site is dominated by quartzite flakes (23), with five of chert and one of basalt making up the remainder. No features were found, and the site is considered not significant.

5LA7281 - This is an eligible site; for a full description see Chapter III.

5LA7282 - This is an eligible site; for a full description see Chapter III.

5LA7283 - This is an eligible site; for a full description see Chapter III.

5LA7284

The site consists of a relatively sparse scatter of lithics that is located on the ridge above an unnamed side drainage of Stage Canyon. One hundred thirty-four pieces of lithic material were analyzed on the site and found to be made of the following materials: quartzite (115), chert

(14), quartz (2), limestone (1), obsidian (1), and basalt (1). The tools are diverse and include: a quartzite point fragment; two quartzite unfinished bifaces; six retouched or utilized flakes (one petrified wood, two chert, and three quartzite); and three crude quartzite core-tools made by bifacial preparation. Soils are eroded and thin on the site. No features were noted, and the site does not appear to have any good potential for excavation. Therefore, it is not recommended for additional research.

5LA7285

The site is a large diffuse lithic scatter stretching over two knolls above the outer side of a narrow wash. A rockshelter, within the site boundaries, is actually a shallow overhang measuring 3 x 3 m, with a sparse lithic scatter out in front. An obsidian projectile point, sourced to the Polvadera Peak, New Mexico locality, was found in front of the rockshelter. A little north of the rockshelter, we found a historic drift fence facing in a north-south direction (about 20 m). The drift fence is not continuous. There is very little deposition on top of the knolls and in the wash; however, some places have brown sandy soil deposits 20-30 cm deep.

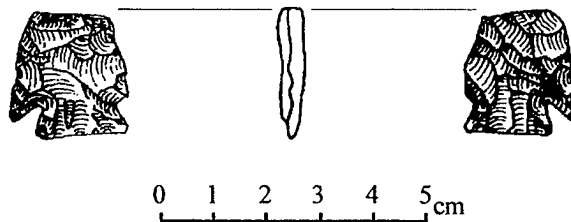


Figure 3: Projectile point (5LA7285.0.9) from 5LA7285.

Surface flaking debris is made of quartzite (28), argillite (3), chert (3), and quartz (1). In addition to the obsidian projectile point (Figure 3), we recorded other quartzite (Type 2) bifaces, a chert end scraper, four retouched/utilized flakes (three quartzite and one obsidian), and two quartzite non-bipolar cores.

The site does not exhibit areas where we think there may be intact buried deposits. The absence of fire-related materials, such as heat-altered stones, suggests the site does not have good potential for additional research.

5LA7286

The site consists of a moderately dense scatter of lithics in a drainage bottom. No diagnostic artifacts were identified among the surface flaking debris. Material types include quartzite (19), chert (3), and obsidian (1). The obsidian was not analyzed to learn its source. A large biface scraper made of chert, a quartzite patterned biface (Type 2), and a quartzite non-

bipolar core were found on the site.

This site has some areas where the brown silty loam soils may have depth. However, the absence of any fire-related artifacts on the surface suggest it is not a good candidate for additional work. It is not recommended for the National Register.

5LA7287

This site is a small, localized scatter of chipped-stone flaking debris located on a partially deflated gentle slope overlooking a north-south-trending drainage. Artifacts are fashioned from quartzite (14), chert (4), basalt (2), and obsidian (1). The obsidian was not analyzed to learn its source. No tools or features were found, and the site is not significant.

5LA7288

The site consists of a localized scatter of lithic artifacts. Surface flaking debris is made of the following materials: quartzite (11) and chert (2). No diagnostic artifacts were identified, although one utilized flake, made of argillite, was collected. The site lacks any fire features, and there is little opportunity for any significant research. It is not recommended for the National Register.

5LA7289

The site is a surface scatter of chipped-stone flaking debris. It is located on a bench below an east-trending slope of a ridge overlooking Stage Canyon. The debris is made of quartzite (41), chert (15), argillite (2), and quartz (1). Tools include four retouched flakes and a core. No evidence of former fires was noted on the site. No areas of good soil deposits were apparent to the survey crew, and additional research is not warranted.

5LA7290

The site consists of a scatter of lithic debris (11 quartzite flakes and one chert flake) and artifacts. One Late Prehistoric-style point base was collected but could not be typed. No other tools were found, and no evidence for former fires was noted. No ground-stone tools were found and areas for excavation were not apparent. The site is not considered to be significant.

5LA7291

The site consists of a very sparse, but extensive scatter of lithic artifacts along the edge of a small drainage. A total of 61 flakes were analyzed and found to be made of quartzite (52), chert (5), basalt (2), limestone (1), and obsidian (1). The obsidian was not analyzed to learn its source. No time-diagnostic artifacts were collected, although a relatively large number of tools were found. They include a quartzite biface tip, two quartzite and one chert retouched flakes, two quartzite large and crude bifacial tools, and one quartzite non-bipolar core or hammer stone. A mano was noted at the site as well, but the recording was done prior to developing the

recording format for ground-stone tools. No additional work is recommended for the site.

5LA7292

The site consists of a sparse scatter of lithic artifacts in the bottom of a small drainage. Surface visibility was poor (roughly 50%), and 20 to 30 cm of deposition is present at the site. Several small rock overhangs with no evidence for habitation occur on the northeast edge of the site. Surface-recorded flakes are made of quartzite (29), chert (6), and argillite (2). Two Type 2, thin patterned bifaces made of quartzite; a chert Type 3, unfinished biface; a quartzite retouched or utilized flake; and three quartzite non-bipolar cores were found. Although this site has areas where there may be buried remains, the absence of heat-altered stones suggests it does not contain any fire features. The site is not recommended for additional research.

5LA7293

The site consists of a very sparse scatter of lithics on the upper edge of a small drainage. Material types in the 10 flakes include quartzite (6), chert (3), and argillite (1). A quartzite non-bipolar core that was apparently used as a hammerstone and an argillite retouched flake were noted among the surface flaking debris. No evidence for former fires was noted, and no ground-stone tools were found. Compared with others in the vicinity, the site is small and insignificant.

5LA7294

The site consists of a sparse scatter of lithic debris on top of a small ridge. No time-diagnostic artifacts were found, but a large and crude quartzite biface was recovered. Flaking debris, analyzed on the site, is made of 18 pieces of quartzite and three pieces of chert. No features were noted on the site surface. In the absence of any way to assign the site to a time period and without any good areas where there might be buried cultural remains, we do not think the site is significant.

5LA7295

The site is a small scatter of lithic artifacts, some bone probably not associated with the site, and one fired (>43) .50 BMG cartridge. The site faces the slope on a narrow terrace above the Stage Canyon drainage. The surface debitage is made of the following materials: quartzite (23), chert (10), and quartz (2). Chipped-stone surface artifacts include two quartzite unfinished bifaces, one of which has some use wear, two quartzite retouched or utilized flakes, and one large and crude bifacially prepared core-tool. Soils are thin on the site, and further work is not recommended.

5LA7296

The site is a lithic scatter at the base of a ridge extending northward and downward into a small, intermittent stream channel which flows west into a larger stream that flows northeast into Stage Canyon. Seven quartzite flakes make up the analyzed chipped-stone debris found on the

surface. A single unfinished quartzite biface was found among the flakes. No features were noted, and the site is not worthy of additional research.

5LA7297

The site is a dense lithic scatter around the curved 'S' foot of a hill above the north bank of an intermittent stream that flows west to Stage Canyon. Grama grass, prickly pear, and juniper dominate the vegetation on the site. Surface flaking debris, analyzed on the site, includes 70 pieces of debitage. They are made of quartzite (49), chert (12), basalt (5), and argillite (4). Tools include a chert patterned biface that is small and thin (an expedient drill?), a quartzite unfinished biface, a chert fragment of an irregular-shaped biface, two quartzite retouched/utilized flakes, and a quartzite non-bipolar core. A broken, oval-shaped sandstone mano was also noted. Additional research is not recommended for the site.

5LA7298

The site is a lithic scatter located on a bench between a creek bed and a rock outcrop. The material shows up in tank tracks, an old roadbed, and the edge of the creek bed, although visibility is also good elsewhere. This may suggest that the material is slightly subsurface and is visible in areas where erosion has occurred. A possible structure, made of slab sandstone with an oval shape was noted. It measures 2.3 x 1 x 1.6 m. Surface flaking debris is made of quartzite (35), basalt (3), chert (1), obsidian (1), and petrified wood (1). Artifacts include a quartzite unfinished biface that may have been used and a quartzite core-tool.

A historic component on the site consists of a scatter of artifacts near a collapsed single-room stone structure with a field-stone foundation. The foundation measured 18 x 12 feet. Artifacts noted on the site include fragments of aqua bottle glass from the shoulder and neck area, with no markings, a strong mold seam, and no patina. A metal can approximately 3" in diameter with the word "SANITARY" on its base and a top opening, possibly cut by a knife in an "X" or "+" pattern, was also found. The can had about six bullet holes (ca. .22 cal) in it. Wire cut nails were also found on the site, which are apparently the recent remains of a temporary outbuilding or short-term habitation. Neither the prehistoric nor the historic components of the site are considered significant.

5LA7299

The site is a low-density lithic scatter. The site is located on a small drainage downslope from site 5LA7295. Sixteen flakes of quartzite were found with four of chert and one of basalt. Artifacts include two quartzite retouched flakes and a thin, patterned, quartzite biface (Type 2). A broken mano and a broken metate, both of sandstone, were also found. Soils are thin and filled with gravel. Additional research, such as test excavations, is not recommended.

5LA7300

The site is on the slope of a ridge defined by arroyos to its north and south sides. There are scattered juniper trees with some grass cover. There is a ridge to the north of an unnamed intermittent stream that feeds Stage Canyon. Artifacts are thinly scattered, with occasional clusters. The surface lithic detritus is made of quartzite (51), chert (5), argillite (1), and quartz (1). Chipped-stone tools include a Type 2 quartzite biface, two unfinished quartzite bifaces, one of which is fragmentary, one chert unfinished biface, an unusual, possibly reworked chert biface fragment, a quartzite flake with irregular retouch on it, three quartzite and one chert bifacial core-tools, and one chert non-bipolar core. One broken quartzite mano was also found.

The site does not have areas where investigators thought there might be buried deposits. No features were noted, and additional research is not recommended.

5LA7301

The site is a light scatter of lithic debris and tools on the north side of a ridge overlooking Stage Canyon, eroding downslope from a knoll. Surface chipped-stone detritus is made of quartzite (48), chert (2), and basalt (1). Tools include a Type 2 patterned biface, an unfinished quartzite biface, three retouched flakes, one that may have been used as a scraper, a large quartzite bifacial core/tool, and a chert non-bipolar core. Soils are less than 10 cm in depth and without any evidence of former fire features. The site is not considered significant.

5LA7302

The site is a diffuse lithic scatter down the north-trending slope of a north-south-trending ridge, south of Stage Canyon. Lithics consists of 14 flakes – nine quartzite, one quartz, one basalt, two chert, and one argillite. No tools were found, and no features were noted. The site is not significant.

5LA7303 - This is an eligible site; for a full description see Chapter III.

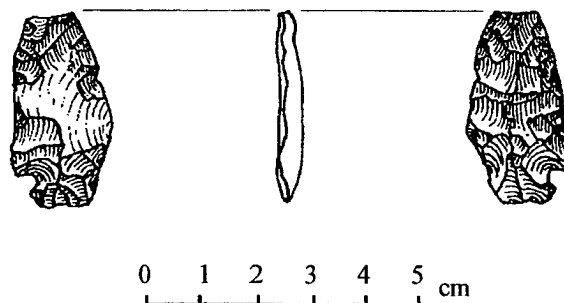


Figure 4: P26 type projectile point from the surface of 5LA7304.

5LA7304

The site is a diffuse lithic scatter on a ridge slope overlooking a subsidiary unnamed drainage to the south of Stage Canyon and to the east of 5LA7303. The light scatter of lithic artifacts included quartzite (8), chert (4), argillite (1), and petrified wood (1) flakes. Stone tools from the site include a small, thin, chert projectile point, two quartzite Type 2 bifaces or projectile points, a quartzite unfinished biface, a basalt or possible hornfels unfinished patterned biface, and a chert end scraper. A metate fragment was also noted. One projectile point (5LA7304.0.2) is classified as a P26 type (Figure 4), and has associated dates of 1000 B.C. to A.D. 500. This site is probably related to its neighbor and only important in that regard. In other words, if the larger site is investigated, this site should be considered as related and revisited.

5LA7305

The site consists of a light lithic scatter of various kinds of debitage on the west slope of a mesa top overlooking an unnamed drainage south of Stage Canyon. The material types are relatively diverse and include quartzite (9), chert (4), basalt (3), limestone (1), quartz (1), and petrified wood (1). A basalt uniface scraper was the only tool recovered from the site. No features were evident and additional research is not warranted.

5LA7306

The site consists of a diffuse lithic scatter distributed throughout sandstone bedrock on a mesa top. Lithics include debitage, a mano fragment, and one projectile point fragment. The projectile point (5LA7306.0.1) conforms to Anderson's P21 type. The debitage consists of 15 quartzite and four chert pieces. North of the debitage we noted a deflated rock ring consisting of about eight horizontal sandstone slabs, each measuring about 60 x 60 cm. The poorly formed circle has a diameter of 2 m (exterior) with no in-fill and no cultural materials. It may have formed naturally rather than being man-made. No further work is recommended for the site.

5LA7307 - This is an eligible site; for a full description see Chapter III.

5LA7308

The site is a rockshelter at the foot of a natural sandstone face at the eastern edge of a ridge of land extending roughly northwest between two unnamed, intermittent streams. There is at least 10 cm of fill in the rockshelter itself. Some large roof fall is present. The top of the fall, but not the overhead scar, has light varnish, suggesting it may have fallen in the relatively recent past. It may have intact remains beneath it. The site is immediately below lithic scatter 5LA7300, and the two sites may be associated. A shallow rock overhang (without evidence for human occupation) is also present at the site. The rockshelter with evidence of former use measures 5 x 1.5 m, not including the area under roof fall. A sandstone wall along the front edge of the shelter measures 4.5 x .35m.

Flaking debris from the site includes six quartzite flakes and one chert flake. Two crude quartzite-battering tools were the only chipped-stone artifacts found. A broken oval-shaped mano and a broken oval-shaped metate were also found. Both are made of sandstone. The absence of heat-cracked stone and the lack of time-diagnostic artifacts lead us to believe the site will not contain significant remains. No additional research is recommended.

5LA7309

The site is a rockshelter in the terrace edge below a hill located above an arroyo which extends west-southwest down to an unnamed, intermittent stream that feeds down into Stage Canyon. Artifacts include ground and chipped-stone scattered in clusters along the length of the terrace to the north-northeast of the shelter. Varied lithic raw materials used included quartzite (20), chert (10), and quartz (1). Chipped-stone tools include a small corner-notched projectile point made of chert, a bifacially reduced quartzite flake that may be a projectile point preform, a large quartzite biface which is apparently a back-hafted knife, a Type 3 quartzite biface, a scraper made of chert with a potlid fracture from heat, two quartzite retouched flakes, and a quartzite core fragment. The diagnostic projectile point (5LA7309.0.1) is classified as a type P68 (Figure 5) and dates to the Ceramic Stage.

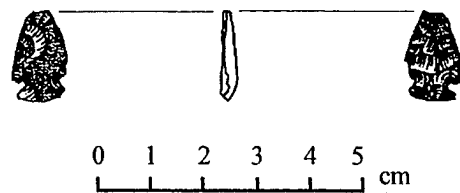


Figure 5: P68 projectile point from the surface of 5LA7309.

Ground-stone tools include a complete oval-shaped mano made of sandstone, a broken oval-shaped mano made of quartzite, and a shallow-basin shaped metate. One of the manos has a keeled edge. An unidentified iron object in the form of a heavy-gauged wire ring, possibly japanned, 7 and 3/8 inches in diameter was found in the rockshelter. It has form-stamped sheet-metal arms with holes that are fixed to the ring. Arms have decorative curvatures with holes at their mid-points for rivets or sew-throughs. These 5.5-inch arms each terminate in a similar hole, each of which is broken through at the mid-line. Its original function is unknown.

We also found a probable iron axe fragment. It includes hexagonal cross-section poll and sub-rounded wings to either side of the hafting socket. The poll extends ca. 1 7/8 inches long and 1 1/8 inches wide and shows much use. The hafting socket is 1 3/4 inches long and 5/8 inch wide (max). The hafting socket is broken through toward narrow end. Poll shows some embrittlement cracking at one edge. Possible blacksmith work, but more likely simple factory manufacture.

We do not believe the site has potential for additional research. The absence of fire related stones, suggests we would not find intact hearth remains with charcoal to use for dating purposes. We also do not think there is much depth in the rockshelter.

5LA7310 - This is an eligible site; for a full description see Chapter III.

5LA7311 - This is an eligible site; for a full description see Chapter III.

5LA7312

The site consists of two rockshelters above an unnamed, intermittent stream that flows west-northwest into Stage Canyon. The rockshelters are in close proximity, with chipped-stone materials scattered below them. There is a bedrock metate downslope of the rockshelter labeled as Feature 1. The site is immediately below lithic scatter 5LA7311 and may be associated. However, the main concentration of artifacts at 5LA7311 was roughly 60 m upslope from the rockshelters at 5LA7312. The rockshelters measure 7 x 3 m and 4 x 1.25 m. The bedrock grinding area has dimensions of 57 x 31 cm.

Chipped-stone debitage is made of quartzite (17), chert (3), and basalt (2). The chipped-stone tools include: an exhausted chert core and a partially reduced quartzite core, a large bifacially made pounding tool, two quartzite retouched flakes, and a thin, patterned biface that may have been used as a hafted knife. A fragment of a sandstone metate was also noted.

Field investigators did not believe the site has much potential for the recovery of intact cultural remains. Its importance rests primarily with its possible relationship to 5LA7311.

5LA7313

The site is a small (7 prehistoric artifacts), dispersed lithic scatter on a small terrace abutting a large plain. Two green glass bottle fragments and a metal solder-top lid were also recorded. No features were observed. Tools include a chalcedony retouched flake, made of a non-local material; and a quartzite, Type 2 patterned biface that is the base of a Type P4 projectile point. The flakes are basalt (2) and chert (3). The site is unusual in that it does not contain quartzite flakes in an area where these tend to dominate. In the absence of fire-related features, we do not believe it is significant.

5LA7314

The site is a thin lithic scatter on the gentle west slope of a hill just south of Stage Canyon and between two north-flowing, unnamed, intermittent stream drainages that serve Stage Canyon. Flaking detritus, analyzed on the surface, includes quartzite (18), chert (10), basalt (2), and argillite (1). Artifacts are chert and quartzite bifaces and a quartzite retouched flake. They do not have any diagnostic attributes. Although it is believed the soils on the site could have some depth, the site is not recommended for additional research. The absence of artifact concentrations and the lack of fire-related debris suggest it would not produce intact remains.

5LA7315

The site is a scatter of chipped stone on a shallow but variable slope, running south-southeast to an unnamed, intermittent stream. The drainage flows west to Stage Canyon. Flaking detritus, found on the surface, includes quartzite (18), chert (6), argillite (1), and basalt (1). Tools found on the site are a chert corner-notched projectile point, a thick quartzite biface identified as a Type 2, but possibly a Type 3, the distal portion of a chert end scraper, and a chert core fragment. The projectile point could not be classified under Anderson's (1989) point typology. The site does not exhibit any features, and soils are thin. No further research is recommended.

5LA7316

The site is a thin scatter of chipped lithics on the south slope of a ridge of land separating two intermittent streams which serve Stage Canyon to the north of the site. Only chipped lithics are found and they were found to be made of quartzite (48), chert (7), and basalt (4). Tools include a chert projectile point that is relatively thick with corner-notches, two chert and one quartzite biface that are in various stages of refinement, a chalcedony patterned tool that is similar in color and texture to Knife River Flint made into a what appears to be a scraper, a chert retouched/utilized flake, a quartzite retouched flake, and a chert core fragment. The projectile point (5LA7316.0.4) dates to the Ceramic Stage and is classified as a P66 type (Figure 6).

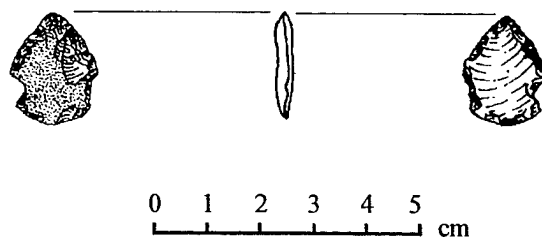


Figure 6: P66 projectile point from the surface of 5LA7316.

No evidence of former fires was found on the site. Soils are thin, and areas where buried deposits might be located were not evident. Additional research is not recommended.

5LA7317

The site is a small, but dense, cluster of chipped-stone tools and flakes located in a shallow and actively eroding area. The area is surrounded on three sides by more steeply angled and rocky, previously eroded slopes. The site is at the margin of a hill separating unnamed, intermittent drainages which flow north to Stage Canyon. Three quartzite flakes and a single

chert flake compose the surface flaking detritus. Stone tools include a basalt or hornfels end and side scraper and a chert projectile point preform (Type P49). This small site may represent a relatively late camping location for a small group. Without evidence of fires and with no other features to investigate, the site is not considered a good candidate for additional research.

5LA7318

The site is a dispersed lithic scatter with one central concentration of artifacts. The site is located on a ridge/mesa situated in a stand of juniper. The artifacts include miscellaneous lithic debitage, one biface, and one mano. Density of artifacts around the datum is about 2-3 m between artifacts. Density around the perimeter of the site is more diffuse --about 5-6 m between artifacts. Surface debris is made up of quartzite (39), chert (6), basalt (1), and argillite (1). Surface-collected and analyzed artifacts include a large unfinished quartzite biface. A sandstone mano fragment was also noted, but no fire-cracked rocks were found, and without evidence for fire features, the site is not a good candidate for further work.

5LA7319

The site is a fairly well localized lithic scatter. The site is on a ridge/mesa top amongst low junipers. Artifacts include a Late Prehistoric projectile point (chert, Type P85), a biface (quartzite), and a retouched flake (quartzite). The projectile point is seen in Figure 7 below. The remaining artifacts are miscellaneous lithic debitage -- quartzite (7), basalt (3), chert (3), argillite (2), and chalcedony (1). Site density is highest near the datum, with an average distance between artifacts of about 1-2 m, and becomes more diffuse around the perimeter (about 4-5 m apart). The site is small, covering an area slightly more than one-tenth acre. Features were not found, and further work is not warranted.

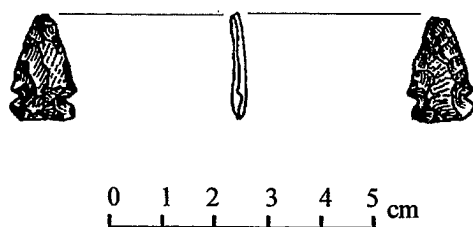


Figure 7: P85 projectile point from the surface of 5LA7319.

5LA7320

The site is a lithic scatter with a dense concentration of lithic debitage and tools located near the datum. Debitage includes some possible non-local quartzite (14 pieces were noted and

we collected a small sample). Other materials include regular quartzite (49) and chert (4). In the concentration, flakes are located about an average of 30-40 cm apart. Density of artifacts dissipates on the periphery of the site, where artifacts are about an average of 10-15 m apart. The site is located on top, but near the edge of a drainage. All artifacts are located on top and none were found on the slopes leading to the drainage. The site is in a small clearing surrounded by a relatively dense stand of juniper trees. Stone tools include a Type P45 patterned biface made of basalt (Figure 8), two fragments of the same quartzite biface, and a quartzite retouched flake. Soils are thin, and the site does not have areas where investigators believe there might be buried deposits. Additional research is not recommended.

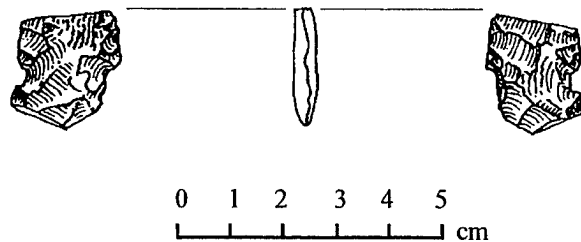


Figure 8: P45 projectile point from the surface of 5LA7320.

5LA7321

The site is a light lithic scatter on a mesa top consisting of debitage and one quartzite core that was not collected. Surface flaking debris consists of quartzite (18) and chert (3). This represents the standard mix of materials for many of the lithic scatter sites in the Black Hills. No ground-stone tools were found, and no evidence for fires was noted. The site is one of the many small lithic scatters that are found throughout the PCMS. It is not significant.

5LA7322

The site is a light concentration of lithic debris, including two utilized biface tools and two manos on a mesa top south of Stage Canyon and just northwest of site 5LA7321. Surface flaking debris is made of quartzite (7), chert (4), basalt (2), and argillite (1). Both manos are broken; one is sandstone and the other quartzite. Areas with well-developed soils and the potential for buried cultural remains were apparent, but no evidence for former fire features was found on the site surface. Additional research is not recommended.

5LA7323

The site is a moderately concentrated lithic scatter located primarily in clay pan blowouts in sandy soil on a mesa to the south of Stage Canyon. Artifacts consist of miscellaneous debitage

and assorted tools including manos, scrapers, and cores. Artifacts, including flakes and a small projectile point, appear also to be eroding down a north-trending natural declivity. The projectile point (5LA7323.0.8) resembles Anderson's (1989) P53 type (Figure 9), which has associated dates of A.D. 700 to A.D. 1400. Surface flakes are made of quartzite (57), chert (18), argillite (2), and basalt (2). In addition to the small chert projectile point, four retouched flakes (one chert, two quartzite, and one argillite) were found, as well as a quartzite non-bipolar core. The site is eroded and not a good candidate for excavation.

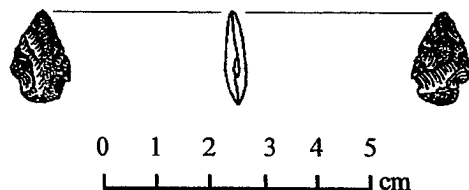


Figure 9: P53 projectile point from the surface of 5LA7323.

5LA7324

The site is a light, diffuse lithic scatter on a mesa top south of Stage Canyon. The locally obtained lithics included debitage only (eight quartzite flakes and one chert flake). This mixture of material types is standard for other lithic scatters in the Black Hills region. No features were noted, and additional research is not warranted.

5LA7325

The site is a light concentration of debitage and one mano, located above, in, and below a natural declivity to an unnamed drainage. It appears to be associated with sandstone ledges and a probable rock-shelter and seep in the drainage below. The rockshelter is in the opposite side of canyon to the east. It was not investigated or added to the site inventory. Surface flaking detritus include quartzite (19), chert (3), argillite (1), and basalt (1). Chipped-stone tools were not found on the site, but a single edge-ground cobble fragment was noted. It was made from basalt, had an oval shape, and a single keeled edge that was heavily ground. Soils on the site are thin. Investigators did not find areas where they thought there might be buried deposits. Further work is not recommended.

5LA7326

The site is a moderately dense lithic scatter on the east slope of a mesa to the south of Stage Canyon. Artifacts consist of debitage (104 quartzite flakes and 10 chert flakes) and one piece of ground stone (sandstone metate fragment). No other artifacts or features were found in this relatively large number of surface flakes. Additional research is not recommended.

5LA7327

The site consists of a moderately dense scatter of lithic artifacts. Surface lithics consist of 56 quartzite flakes and five chert flakes. This distribution is like that of many sites in the Black Hills, where quartzite dominates the collections. No time-diagnostic tools were identified. A chert end scraper was collected from the site. Additional research is not recommended.

5LA7328

The site is a localized lithic scatter on top of a mesa south of Stage Canyon. Lithics consist of chert (8) and quartzite (36) flakes and one fragment of a fine-grained sandstone milling slab. Chipped-stone tools include three temporally diagnostic projectile points. Two of these (5LA7328.0.1 and 5LA7328.0.2) date to the Archaic and are classified as P16 (chert) and P4 (argillite) points. The third diagnostic point (5LA7328.0.3) is made of chert and conforms to Anderson's P84 (Ceramic Stage) type. This is a relatively common pattern where the tools are made from materials other than those found in the surface debitage. It suggests that the quartzite was used for everyday tools and to make expedient artifacts for short-term use. No features were identified on the site, and additional research is not recommended.

5LA7329

The site is a diffuse lithic scatter on top of a mesa contiguous to the south side of Stage Canyon. Artifacts included 42 quartzite flakes, a single chert flake, and a chert uniface that apparently served as a scraper. Soils are thin, and no features were found on this small site. Further work is not warranted.

5LA7330

The site is a small, very sparse lithic scatter on a flat mesa top adjacent to a maneuver road. Only six flakes were recorded (five quartzite and one chert), indicating lithic reduction as an activity at the locus, but little else. Soil depth (20-30 cm) has potential for buried deposits, but with no features and no evidence of flaking concentrations, the site is not a good candidate for additional research.

5LA7331

The site is located partially on top and partially on the slopes of the drainage. The lithic scatter is rather diffuse, with 8-10 m between artifacts. The site has miscellaneous lithic debitage (quartzite 10, chert 12, argillite 1, basalt 1, and obsidian 1) and one large corner-notched (Type P29) projectile point. Soils are thin, and there are major areas of exposed caprock in the site area. Excavation or further research is not a good option.

5LA7332

The site is a light lithic scatter on the west-facing slope east of an unnamed drainage to the south of Stage Canyon. It consists of flakes (one quartzite and one chert) and one chert scraper. No other cultural evidence was found at the location. Owing to its small size and low artifact count, the site is not considered significant.

5LA7333 - This is an eligible site; for a full description see Chapter III.

5LA7334

The site is an isolated diffuse scatter at a north point overlooking the convergence of two unnamed drainages to the south of Stage Canyon. Surface chipped-stone debitage is made of 10 quartzite flakes, one basalt flake, and one chert flake. Artifacts include an argillite core, and a quartzite retouched and perhaps utilized flake. No ground-stone tools were found, and no features were noted. Further work is not recommended.

5LA7335

The site is a diffuse lithic scatter, one retouched/utilized flake tool, and one piece of metate slab fragment above a probable rockshelter. Five quartzite flakes and one argillite flake were noted. It is situated on the edge of a west-sloping mesa top east of an unnamed drainage to the south of Stage Canyon. The site is to the southwest of site 5LA7334 and north of site 5LA7333, and perhaps related to its neighbors. Independent of the other sites, 5LA7335 is not significant.

5LA7336

The site is an isolated diffuse scatter of lithic debris on a mesa top south of Stage Canyon. Lithics included five quartzite flakes and one small quartzite biface. No ground stone or features were noted. The site is not a good candidate for additional research.

5LA7337

The site is a light, very diffuse lithic scatter on top of a north-trending mesa south of Stage Canyon. Artifacts included flakes (five quartzite, two basalt, and five chert), one small chert scraper, and one complete oval-shaped mano made of quartzite. No fire features were noted and, without the potential to date the site, it is not significant.

5LA7338

The site is a thin lithic scatter over a small area on the north toe of a ridge separating two north-flowing, unnamed, intermittent streams that flow into Stage Canyon. Located below the caprock and outside the site limits are four possible rockshelters. Several rock rings are present in site area. These are possible hearths but lack artifacts, ash, or charcoal to prove actual origin.

Surface flaking debris includes two argillite flakes and an argillite drill. One suspects the rockshelters, which are outside the site boundaries, may contain materials. The rock rings are not worth additional investigation.

5LA7339

The site is a thin lithic scatter covering the top of an eroded knoll, its slopes, and flanks at the end of a ridge between the drainages of two north-flowing, unnamed, intermittent streams that serve Stage Canyon. The site includes two small high-density concentrations: A (top of knoll) and B (at foot of knoll). Surface flakes are made of quartzite (34), chert (10), and petrified wood (1). The few tools include two quartzite and two chert non-bipolar cores, a quartzite biface that is unfinished, and a quartzite retouched flake. There are areas where soils could be as much as 16 cm deep on the site, but without any evidence for fire features, the site is not worthy of additional investigation.

5LA7340

The site is on flat ground at the head of an unnamed, intermittent stream that flows north to Stage Canyon. It consists of a very thin scatter of lithic debris in an area about one-tenth of an acre in size. A single biface was recorded along with six fragments (four quartzite and two chert) of chipped-stone debris. No features or ground stone were recorded. The site is one of the relatively common scatters of minor amounts of chipped-stone debris found in the juniper-covered, broken terrain throughout the Black Hills.

5LA7341 - This is an eligible site; for a full description see Chapter III.

5LA7342 - This is an eligible site; for a full description see Chapter III.

5LA7343

The lithic scatter is located on the slope of a hill to the east of a drainage of an intermittent stream that flows north into Stage Canyon. Vegetation on the site includes bunch grass, prickly pear, barrel and cholla cactus, and scattered junipers. The site covers slightly more than one-quarter of an acre and the chipped-stone debris on the surface includes 19 flakes (10 quartzite, seven chert, and two basalt). No tools were collected, no features were noted, and no ground stone was recorded.

5LA7344

The site is located on a shallow slope of a hill on the east side of the drainage of an unnamed stream that flows to the northwest and into Stage Canyon. It consists of a low-density lithic scatter with a few stone tools. The flaking debris consists of 44 flakes that is dominated by chert and quartzite with lesser amounts of basalt, chalcedony, petrified wood, and quartz. No features were found and no ground stone was noted. The tools collected did not include any that

are temporally diagnostic, and without them there is no evidence as to the age of this small scatter of chipped-stone debris.

5LA7345

The site is a low-density scatter of chipped lithics on a gradual slope above a north-flowing stream serving Stage Canyon. Covering an area of about one-quarter acre, the site is much like its neighbor 5LA7346. Fourteen flakes were recorded from the surface of the site. Of these flakes, seven were quartzite, four were chert, one was chalcedony, one was petrified wood, and one was an obsidian flake. The obsidian flake was collected, but no tools were found.

Features were not found, nor was any ground stone noted. The site is one of the dozens of small scatters of chipped-stone debris in the region.

5LA7346

The site is a low-density scatter of chipped stone on the slope above the east side of a north-flowing unnamed stream which serves Stage Canyon. The site is on a gradual sloping area with juniper as the dominant vegetation. No features were found on the site, nor were there any temporally diagnostic tools in the inventory.

Of the 40 flakes analyzed, 18 were chert, 17 quartzite, two were chalcedony, and one flake each of basalt, petrified wood, and obsidian is recorded. The obsidian flake and a single small chert end scraper were collected from the site.

5LA7347

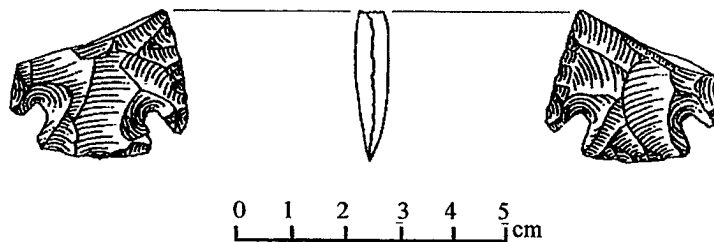


Figure 10: P27 projectile point from the surface of 5LA7347.

The site consists of a concentrated scatter of chipped-stone debris and tools with areas of high density. It is located on a gradual hill slope over an unnamed small, west-flowing drainage that serves Stage Canyon. The site is somewhat notable in that a variety of raw materials were used. Materials are dominated by chert and quartzite but also include hornfels/basalt and

argillite. A single, very large corner-notched projectile point (5LA7347.0.2, Type P27), the broken fragment of an end scraper, a quartzite core fragment, two retouched/utilized flakes (one of chert and the other of basalt), and a quartzite biface fragment were recovered. The projectile point is presented in Figure 10 above.

About a half-acre in size, the site is located on a shallow slope above an unnamed, west-flowing stream which, after joining with a longer north-flowing stream, drains into Stage Canyon. Vegetation is dominated by juniper.

5LA7348

The site consists of a sparse scatter of lithics. One medium-sized corner-notched projectile point made of chert and one retouched and apparently utilized chert flake were recovered. The projectile point (5LA7348.0.1) is classified as a P42 (Figure 11) type, which dates to the Middle Archaic period. Three chert flakes, two quartzite flakes, and a single chalcedony flake make up the chipped-stone debris observed on the site.

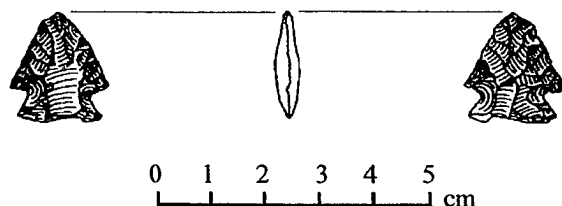


Figure 11: P42 projectile point from the surface of 5LA7348.

The site is situated on a slightly sloping area along the point of a hill. There is a good view to the southwest. The surface offers high visibility with little vegetation and open areas between the plants. No features were noted, nor were there any obvious places where we suspected buried cultural remains.

5LA7349

The site consists of a moderate-density lithic scatter on the edge of a small, unnamed drainage on the west side of the Black Hills. No temporally diagnostic tools were identified at the site, and the only identified tool is a medium-size, irregularly shaped biface made of quartzite. No features were identified.

Although the site is slightly more than a half-acre in size, it represents one of the common scatters of chipped-stone debris that have no apparent depth and therefore is not a good candidate for additional research.

5LA7350

The site is a moderate-density lithic scatter on a ridge between two drainages -- one to the east and the other to the west. The drainage to the east is about 100 m away, and the drainage to the west is about 30 m. There is good visibility of the plains from the site. Some of the surface lithics are clustered on the southwest side of the ridge, but they are not contained in any feature or associated with the remains of former fires.

The site covers an area of about one-third acre. Juniper is the dominant vegetation, with lesser amounts of cholla and various grasses. Soils are thin and probably not more than 10 cm in depth across most of the site.

Twenty-six flakes were analyzed and found to include 17 made of chert, seven of quartzite, one of hornfels/basalt, and one of kaolinite. The tools include a small quartzite biface that may be part of a projectile point, an irregular quartzite biface fragment, and a chert retouched/utilized flake.

5LA7351 - This is an eligible site; for a full description see Chapter III.

5LA7352

The site is a small lithic scatter that is located on the top of a ridge between a drainage and the plains on the west side of the Black Hills. It covers slightly more than one-half acre, and although we recorded 121 flakes, no features were found. Quartzite (96) dominates the flaking debris, with chert (22) next in importance. Three flakes of basalt make up the remainder of the analyzed flaking detritus. The tools include two possible projectile point preforms or early-stage points made of chert, a possible point fragment made of chalcedony, a chert core fragment, and a quartzite core fragment.

The site is located on a juniper-covered ridge south of a major drainage to the west. The site slopes down toward the grasslands.

5LA7353

The site is located atop a ridge south of a major drainage 60 m northeast of site 5LA7331. It is a lithic scatter with no features on its surface. Three artifacts including one projectile point and a biface were identified. The chipped-stone debris appears to be more dense in the southwest part of the site, suggesting a discrete activity area. The site covers slightly less than a half-acre, and it is located on a ridge just south of one of the southern drainages of the Black Hills. The site looks south and west over the grassland/plains area.

The flaking debris is dominated by quartzite (13 of 16 flakes), with one flake each of chalcedony, chert, and basalt. The complete projectile point (5LA7353.0.3), made of chalcedony resembles Anderson's (1989) P54 type and dates to the Ceramic Stage. A quartzite biface may be a projectile point preform, and a third artifact recorded on the site is an exhausted chert core. The site lacks good soil deposits and is not a candidate for additional work.

5LA7354

The site is a sparse lithic scatter located on the slope of hill on the western edge of the Black Hills area. The site is in juniper-covered terrain. Five chert flakes were reported from the surface of the site, together with a large corner-notched projectile point base (5LA7354.0.1, Type P26) made of chert.

The entire site is encompassed in an area of about 16 m². Additional work would not likely produce meaningful information.

5LA7355

The site is located 50 m north and upslope from site 5LA7354. Both sites appear to be small scatters of flaking debris exposed by the upturn of the soil by a large motor vehicle, perhaps a tank or Hum-Vee. A two-track is located approximately 45 m southeast of the site datum of 5LA7355. No features were noted, and no ground stone was reported.

Nine chert flakes and three quartzite flakes were found on the site surface. A single crude chert biface was found on the site. Juniper, yucca, cholla, and grama grass grow on the sandy loam at the site. The exposed areas have not turned up buried materials as much as they have opened the vegetation so that the surface is more visible. Further work is not warranted.

5LA7356

The site is a lithic scatter located near an arroyo/gully southwest of a ridge. The site, 400 m northwest of the two-track road, is about 40-50 m wide and slopes toward the southwest. The site contains lithic flakes and one large corner-notched projectile point. No features were identified. No ground-stone tools were recorded. Slightly more than one-third acre, the site is in the juniper with open areas of grassy meadows.

Flaking debris includes four chert flakes found with a corner-notched point (5LA7356.0.2, Type P30) that may be Archaic in age and a biface fragment, both of chert. It is not believed the site contains areas with buried deposits and further work is not recommended.

5LA7357 - This is an eligible site; for a full description see Chapter III.

5LA7358

The site is a sparse lithic scatter with a total of 11 flakes -- 10 quartzite and one basalt. It is located on a rocky slope composed predominately of sandy soil that overlooks the high plains to the southwest. Neither tools nor features were noted on the site. Soil depths are shallow and most likely there are no buried deposits worthy of additional research on the site.

5LA7359

The site is a lithic scatter with a large area of concentrated surface debris near the crest of a mesa, on the top western edge of the Black Hills. It contains flakes, projectile points, and one metate. There is a concentration of lithics at the upper and lower ends of the site. Seventy-three flakes, dominated by quartzite (43) and chert (24), are found on the site, with lesser numbers of basalt (2), limestone (2), petrified wood (1), and argillite (1). The complete sandstone metate measures 44 cm by 29 cm in size. Other tools include Type 2 bifaces, and other flake tools. Two of the projectile points (5LA7359.0.1 and 5LA7359.0.3) have relatively wide temporal ranges that extend from the Early Archaic to the Ceramic Stage. One of these specimens is a Type P4 and the other is a Type P45.

Vegetation on the site is dominated by juniper. Soils are relatively thin, and no areas where buried deposits might be encountered were identified.

5LA7360

The site is located on a slope/ridge 50 m northeast of a large drainage and approximately 200 m east of the two-track road. Its location is actually between two drainages. The sloping area of the site faces and overlooks the grassy plains to the southwest. Tracks from tanks or other army vehicles have been identified and possibly caused an upturn of the soil, resulting in the exposure of lithic material in the areas where the vegetation has been crumbled. The site is small, about one-quarter acre, but it did include a partial biface and an obsidian flake. The other flakes include five of quartzite and three of chert. No further work at the site is recommended.

5LA7361

The site is on the edge and on the slope area adjacent to the edge of a mesa top. This mesa is part of a ridge extending north-south between two unnamed streams. The site extends westward down the cliff edge where a single flake was found. Density of artifacts is light. No utilized rockshelters were noted along the cliff face, and no features were identified.

The site encompasses an area of about one-half acre. Juniper with lesser stands of bunch grass (grama), cholla, prickly pear, and yucca dominate the vegetation.

Flaking debris includes 34 flakes with the following material types: quartzite (25), argillite (5), chert (3), and a single basalt flake. The argillite stands out in this region where quartzite and chert are more common. An argillite core fragment and several flakes may

indicate core reduction and account for the flakes. Two broken manos were recorded. An oval-shaped one is made of quartzite, and the other, which has an irregular shape, is also made of quartzite.

5LA7362

The site, classed as a lithic scatter, is perhaps more appropriately termed a culture material scatter because it includes a mano and a bedrock metate. The site is situated within a saddle on a mesa top/ridge extending north between two unnamed streams that flow north into Stage Canyon. Lithics were found on the south end of the ridge, the south slope of the ridge, and the northern end of the saddle. The site covers slightly more than an acre.

A single, broken, one-hand mano, made of quartzite, was noted on the site. The bedrock metate, located on a sandstone exposure, has two areas of grinding, which in total measure 100 cm by 81 cm. The chipped-stone debris is composed of 23 flakes, 15 of which were quartzite, five argillite, three chert, one quartz, and one hornfels/basalt. Tools include a non-bipolar core, two retouched/utilized flakes, and a crude bifacial core-tool used as a hammerstone. All tools found at the site are made of quartzite.

5LA7363

The site is very diffuse lithic scatter located near the cliff edge, but on the ridge top. A small concentration of flakes was identified in the area where we placed the site datum. Flakes in this area were spaced about 2-3 m apart, while on the periphery they were located about 7-8 m apart. No features were identified. A total of five flakes were recorded on the site, one of argillite, one of obsidian, and three of quartzite. The tools include a crude and unfinished chert biface and a quartz retouched/utilized flake. Juniper, yucca, and prickly pear grow on the site, which is small, covering approximately .157 acres.

5LA7364

The site consists of three main lithic concentrations, with an obvious decrease in artifact density on the periphery of the main concentrations. The concentrations appear to be mainly located in open ground, away from stands of junipers and associated vegetation. The site extends west from the edge of a two-track running roughly north-south in an area that encompasses about three-quarters of an acre. It is situated on a mesa top of a ridge between two unnamed, north-flowing streams. Vegetation consists mainly of cholla, grama, opuntia, and juniper.

Forty-eight flakes were recorded on the surface. Dominated by quartzite (37), the flakes also include chert (10), and argillite (1). Two chert bifaces were among the flaking debris.

5LA7365 - This is an eligible site; for a full description see Chapter III.

State numbers 5LA7366 to 5LA7380 were not used in this project.

5LA7381

The site is a low-density lithic scatter and single, bifacially flaked stone tool. This east-west linear site is located at the west edge of a north-south trending mesa/ridge that separates two unnamed, north-flowing streams serving Stage Canyon. A portion of the site to the west of the road is associated with an incipient gully that runs to the west edge of the ridge/mesa.

The lithics on the surface, confined in an area of about one-quarter acre, are composed of eight quartzite flakes and five chert flakes. Tools include the medial portion of a large unfinished chert biface and a non-bipolar core or biconvex disc made of chert. Neither tool is temporally diagnostic. No features were found on the site, and without any temporally diagnostic artifacts, it is difficult to assess its significance.

5LA7382

The site consists of sparsely scattered lithics with no definite clustering. Randomly dispersed lithics occur over the site, which is located in small area of about 170 m² along a slope. The surrounding vegetation includes cholla, opuntia, grama, and bunch grass, with an overstory of juniper. Some lithics occur near areas of natural material and may indicate testing of this material for its suitability in manufacturing stone tools

The fourteen flakes recorded on the surface were made of the following material types: quartzite (9), chert (4), and exotic chert (1). No tools were recovered in the surface detritus. The site is minor and insignificant.

5LA7383 - This is an eligible site; for a full description see Chapter III.

5LA7384

The site is a lithic scatter within 40 m of the western edge of a mesa/ridge top and above an unnamed stream drainage that flows north to Stage Canyon. It is located on a slight rise between two shallow, grassed arroyos which channel water to the west and over the edge of the mesa. Overstory vegetation is dominated by juniper. The northern half of this rise includes the densest concentration of lithics, while a lithic procurement area, where local stone was tested, is associated with the southern arroyo near the mesa edge and the arroyo mouth where the materials are eroding out. Based on the lush green and higher density of the grasses toward the head of this southern arroyo, it appears to act as something of a catchment, holding water in place. Both arroyos are well vegetated and stable. The site covers about one-half acre.

Chipped-stone debris found on the site consists of 45 quartzite flakes. This supports the contention that the site was a procurement area rather than a tool maintenance area. Two quartzite non-bipolar cores were found in the detritus. A single projectile point (5LA7384.0.5) was recovered at the surface and is classified as a Type P4.

5LA7385

The site is located on a mesa/ridge top that is defined by two unnamed, north-flowing streams that serve Stage Canyon. This lithic scatter is dense and well defined. Three types of raw materials were found, although some of the flaking debris may have been heat treated. The stone materials include 49 quartzite flakes, nine chert flakes, and one chalcedony flake. No features were noted.

Juniper, opuntia, bunch grass, and milkweed were noted on the site. Soils are thin, however, and the site is not a good candidate for additional research.

5LA7386

The site is a low-density scatter of chipped-stone lithics plus a single metate. It is located on the east-draining slope of a hilltop/ridge oriented east-west. The ridge is adjacent to unnamed, north-flowing streams that drain into Stage Canyon. Vegetation is dominated by juniper in the nearly three-quarter-acre site area.

Flaking debris on the site includes 15 pieces of debitage -- 11 quartzite and four chert. Tools include two retouched/utilized flakes, one of chert and the other of quartzite; and three large, crude bifacial core/tools, two of quartzite and one of argillite. The diversity in the flaking detritus suggests multiple activities may have taken place at the site, but it is diffuse, with poor soil deposits and little chance of finding any buried cultural materials.

5LA7387

The site is a large lithic scatter with diffuse chipped stone covering a portion of hill slope on a ridge-line mesa and above an unnamed drainage that flows north into Stage Canyon. The total is 1.27 acres. Dominant vegetation is juniper, but opuntia, grama, cholla, yucca, milkweed, Russian thistle, and foxtail also grow on the site.

Six tools were found on the site. These include three retouched/utilized flakes, two of quartzite and one of hornfels/basalt; an argillite non-bipolar core; a large, crude quartzite biface that appears unfinished; and a large crude bifacial core-tool made of quartzite. Flaking debris is dominated by quartzite (40), with a smaller amount of chert (8). No features were identified. A partial flat metate was found with measurements of 11 cm by 6 cm by 2.5 cm. The site is not a good candidate for further work.

5LA7388

The site consists of a low-density scatter of chipped stone and ground stone on a gradual slope on the west side near the base of a ridge-line mesa oriented on its long axis north to south. Unnamed, north-flowing streams define the ridge on its east and west sides. These streams drain into Stage Canyon. At the base of caprock just below the lithic scatter is a rockshelter, which itself has an associated lithic scatter just downslope from its mouth. A metal bucket containing

the remains of sticks of "40%"-strength dynamite was present in south part of rockshelter. The rockshelter found in the sandstone caprock measures about 10 m across its opening by 2.25 m in depth.

Thirty-three flakes were recorded on the site. As with many sites in this vicinity, they are dominated by quartzite (30), with chert (3) as the remainder. A large quartzite hammerstone and a quartzite discoidal core were found on the site surface. The ground-stone tools include a broken sandstone metate with an irregular shape and a broken quartzite mano.

The site exhibits relatively shallow soil deposits, indicating a low probability of finding any intact cultural remains through subsurface testing or excavation. No fire features were found, nor were any temporally diagnostic tools recovered. The site is not worthy of additional research.

5LA7389

The site is a sparse lithic scatter with a small concentration of lithics found along the western edge of the site boundary. The center of the site is located approximately 9 m from a jeep trail through the area. Vegetation is comprised of opuntia, grama, bunch and foxtail grasses, along with juniper scrub and cholla. The site is located on western slope of ridge-line mesa between two unnamed streams or drainages flowing north to Stage Canyon.

Six flakes found on the site include five of quartzite and one of chert. A single retouched/utilized flake was found on the site. No fire features were noted, nor were there any areas of potential deposition where buried remains might be found. The site does not warrant further work.

5LA7390

The site is a small scatter of lithics located approximately 4 m from the ridge top edge. Lithics are scattered around a ground-stone tool, mainly to the south. Vegetation surrounding site is comprised of grama and bunch grass, opuntia, cholla, and juniper scrub. The site is approximately 2 m south of bedrock ridge.

The flaking debris is made up of two quartzite flakes and one chert flake. A large quartzite scraper was found on the site. Soils on the site are not well developed, and there is little opportunity for finding buried cultural remains.

5LA7391

The site is located upslope, 50 m northwest of a drainage. Site 5LA7352 is located approximately 40 m from this site. Both sites overlook the high plains, which are located approximately 700 m southwest. Site 5LA7391 consists of a sparse lithic scatter with 14 flakes. Eleven are quartzite, one is chert, one is hornfels/basalt, and one is obsidian. The obsidian was sent in for analysis, but a geochemical source could not be determined. Two large broken

bifaces, and a smaller more refined biface (Type P83) were found on the site. All are quartzite.

The site is within the juniper scrubland. Grama grass and cholla were noted on the surface. The soils are thin. No features were found, and the site is not a good candidate for any additional research.

5LA7392

The site is located in a drainage between two ridges. Junipers block visibility of the grasslands located southwest of site. The site consists of seven lithic flakes within approximately a 30 m x 30 m area. No diagnostics were identified. Site 5LA7342 is located 80 m due north of this site, which is important to note because site 5LA7342 is a large site with an area of approximately 500 m x 350 m. This small site may be related to its larger neighbor.

Six flakes are quartzite and one is chert. No tools were found, nor were any features identified. The site is only important in its relationship to 5LA7342.

5LA7393

Site 5LA7393 is a scatter of chipped-stone debris located on a mesa/ridge top. There is a barbed wire fence that crosses north-south through the site. The site measures about 60 m north-south by 40 m east-west. The vegetation in the area is mostly juniper and cholla.

The flaking debris consists of 25 chert flakes, 15 quartzite flakes, three petrified wood flakes, and one hornfels/basalt flake. Tools found in this lithic scatter include a large quartzite biface, broken into three fragments and recovered about a meter from one another; a small, side-notched projectile point made of quartzite; a possible projectile point preform made of obsidian (unknown geochemical source); a chert end scraper; a quartzite flake tool that may have been an end scraper; and a poor-quality chert core. The projectile points (5LA7393.0.2 and 7393.0.3) date to the Ceramic Stage and are P79 and P83 types.

Soils on the site are thin, probably not more than 5 cm in depth, and there were no fire features identified. The site is not a good candidate for additional research.

5LA7394

The site is located on a mesa/ridge top. It is about 20 m north-south and 15-20 m east-west. It is in an open field among cholla and grama with a few juniper. Six flakes were found on the site. Four are quartzite and two are chert. The site is typical of the small lithic scatters that are found in the open areas of the Black Hills. Many have a tool or two; however, this one has none. No additional work is needed at the site.

5LA7395

Twenty-four flakes were found on this site, with 23 of quartzite and one of chert. The dominance of quartzite is fairly common at sites along the margins of the Black Hills where there is access to natural deposits. The site is located on a mesa top. Topography is flat, with very little slope, 0.5 m per 10 m. No tools were identified. No features were noted. The site is not worthy of additional research.

5LA7396

The site is a small lithic scatter that consists of one biface and three flakes. It is located on a mesa/ridge top south of Horse Canyon. The site is 60 m southwest of 5LA7394. At least two of the three flakes found on the site are made from the same chert as the biface, which is actually a fragment of a larger artifact. Although the site is in a general juniper region, the site itself supports cholla and grama grass. No additional work is needed at the site.

5LA7397

The site is a small lithic scatter, with a total of 31 flakes of chert (5) and quartzite (26). Both simple and complex flakes are among them, but no diagnostic tools were identified. The tools recorded include a chert end scraper, and a quartzite retouched/utilized flake.

The site is located on a ridge at the mesa top approximately 75 m north of the rim of Sugarloaf Canyon and 30 m south of the rim of Horse Canyon. Juniper is the dominant vegetation.

5LA7398

The site is a large rock overhang on the east side of a mesa. Only a single flake made of chert was found in the rockshelter, but there is little ground visibility due to the vegetation in front of the site, where lithics would more likely be found. The rock overhang is tall, about 3 m, and about 20 m wide. Juniper, skunkbush, and lemonade bush are present. There are many cavities in the rock wall to hide things. The soil depth in the rock overhang is about 15 cm.

The rockshelter could contain intact cultural remains, but without any evidence of fire features or other features, like bedrock metates, it is not considered worth additional work.

5LA7399

The site is a small lithic scatter located on the west side of the Black Hills about 60 m south of a two-track road. The site has been disturbed by what appears to be military vehicles. Most of the vegetation on site is juniper and yucca and the site is located about 60 m north of a drainage which supports dense stands of juniper. The site is 10 m east-west and 7 m north-south.

A single large retouched quartzite flake with three modified edges was found on the site, with 10 pieces of flaking debitage. Eight of the flakes were quartzite, with the others of chert and argillite. No features were found, and the site is not a candidate for additional research.

5LA7400 - This is an eligible site; for a full description see Chapter III.

5LA7401

The site is a sparse lithic scatter situated on the east edge of a mesa overlooking Horse Canyon. It measures 57 m east-west x 57 m north-south. Vegetation is juniper, opuntia, grama grass, cholla, yucca, and paintbrush. The lithic assemblage consists of one expedient flake tool, one keeled mano, and numerous pieces of flake debitage. The soil found at the site is silty loam. The overall site is moderately to highly disturbed by the historical components and by water erosion. Historic components situated on the southern edge of site, and activities there, appear to have disturbed the prehistoric components.

The flaking debris consists of 25 pieces of debitage as follows: 16 quartzite, seven chert, one argillite, and one hornfels/basalt. The tool is a large quartzite, retouched/utilized flake. Additional research at the site would not produce meaningful results.

5LA7402

The site is located near the western headwaters of Sugarloaf Canyon. The setting is flanked along the north and south by two minor drainages feeding into Sugarloaf Canyon, but the main canyon can be seen to the east of the site. The site extends east down off the ridge top onto a rocky terrace or bench above the canyon. Grama grass, juniper, yucca, opuntia, paintbrush, rice grass, cholla, milkweed, and other assorted grasses are growing on the site.

Artifact density is highly variable. Several widely spaced clusters were organized with artifacts spaced at about 1-2 m apart. One hundred flakes were analyzed in the field, with the following material types -- quartzite (81), chert (15), basalt (3), and argillite (1). These flakes were found in a site area of slightly more than 5 acres. Artifacts include a quartzite, retouched flake tool; a quartzite unfinished, large patterned biface; a quartzite non-bipolar core with numerous flake scars; a large quartzite, retouched flake; a large chert non-bipolar core; the medial portion of a hornfels/basalt unfinished biface; and a small chert patterned flake tool. The fragment of a flat sandstone metate and a broken sandstone mano were also found on the site.

A historical component, located along the northern edge, is composed mainly of the remains of a fence. It is made of stone piles, some with raw lumber, presumably the posts, remaining in them. The piles range from 1 to 2 m apart, and about 20 of them are still evident on the site. A deteriorated can, perhaps a paint can, was found near the stone piles. The remains are relatively recent and insignificant.

5LA7403 - This is an eligible site; for a full description see Chapter III.

5LA7404

The site is located on top of a mesa by the edge of a drainage (east side), but does not extend out to the cliff edge. The boundaries of the site are delineated by the extent of the lithic scatter, which is in an area of about an acre. The artifacts found indicate that chipped-stone tool reduction and vegetal processing using ground-stone tools were activities carried out at the site. The vegetation associated with the site is juniper, different kinds of grass, yucca, opuntia, and cholla. Artifact density is variable. There are several widely spaced artifact concentrations that are characterized by artifacts spaced at about 2-3 m apart. The site is located in a stand of junipers.

Surface flaking debris, analyzed in the field, included 57 quartzite flakes, 10 chert flakes, one chalcedony flake, and one limestone flake. No chipped-stone tools were found, but a broken mano and a broken metate were noted -- both made of sandstone. The site is not significant.

5LA7405

The site is located on top of a mesa and by the edge of a drainage oriented to the east. The lithic scatter determines the boundaries of the site. It is likely that core reduction generated the lithic debitage found at the site. The vegetation associated with the site is juniper, cholla, opuntia, different kinds of grass, and yucca. The site is located within an area of about two-thirds of an acre.

Chipped-stone debris includes 39 quartzite flakes, six chert flakes, and one hornfels/basalt flake. Nine tools were identified as follows: five large quartzite non-bipolar cores, one large chert non-bipolar core, one quartzite unfinished large patterned biface, one chert unfinished patterned biface, and one quartzite non-bipolar core-tool. The site does not have potential for additional research.

5LA7406

The site is located on the north side of Sugarloaf Canyon on a small mesa (350 m wide) between the cliff edge (west) and a low bedrock ledge (east), with Sugarloaf stream on the west side and a dry arroyo on the east side. The boundaries of the site are determined by the extent of lithic scatter visible on the ground surface. Artifacts indicate that core and lithic reduction was an activity at the site. Vegetation noted at site includes juniper, opuntia, yucca, various grasses, and cholla. The artifacts are concentrated around the datum at an average distance of 3-4 m between each. At the peripheries of the site, density drops off at about an average of 7-10 m between artifacts.

The site covers about one-half acre within which 42 flakes composed of 29 quartzite, 12 chert, and one argillite were recorded. Two quartzite retouched/utilized flakes and a quartzite non-bipolar core were found among the flakes. Additional research is not recommended for the site.

5LA7407

The site is located on top of a sloping mesa and by the edge of a drainage. Its boundaries are determined by the extent of the lithic scatter. The artifacts found at the site suggest diverse activities including tool manufacture, core reduction, and vegetal processing. Vegetation associated with the site is juniper, yucca, opuntia, different kinds of grass, and cholla. The site is a large, but diffuse lithic scatter with a small lithic concentration east-northeast of the datum. Artifacts there were about 3 m apart. Peripheries of the site have low densities (10-15 m apart), and the site encompasses a total area of about 3.78-acres.

Flaking debris is made up of 56 flakes, with 44 of quartzite, eight of chert, two of argillite, one of chalcedony, and one of quartz. Chipped-stone tools include two quartzite non-bipolar cores, a large unfinished quartzite biface, a quartzite small, thin patterned biface, and a small, thin chert biface. The two latter tools were likely intended as projectile points, of which only one could be typed (5LA7407.0.2, P79). A kaolinite fragment has incised lines on it, suggesting its use as a decorative item or as a gaming piece.

Two broken manos, one oval shaped and the other with an irregular shape, were also found on the site. They are both made of sandstone. The site is situated on two terraces and the associated slopes of these terraces. It is above an unnamed drainage that flows into Sugarloaf Canyon. There are no areas where buried cultural remains were noted, and the site is not recommended for the National Register.

5LA7408

This is a small, dispersed lithic scatter with two tools and two flakes. The site is located on the ridge top at about 30 m west of a small unnamed drainage that flows into Sugarloaf Canyon. The site is just south of a rather dense stand of junipers in an area of relatively thick deposition (ca. 30-35 cm). It is quite possible that most of the site is buried, but if so it would be difficult to find where to search for intact deposits.

The flakes are both chert, while the tools are a large quartzite, crude and unfinished biface and a chert patterned flake tool. The site does not warrant additional research.

5LA7409

The site, located on a knoll between the confluence of two drainages on a sloped area, is a very sparse lithic scatter. A concentrated area of quartzite detritus, 20 m north of site datum, suggests possible quartzite core testing, but the evidence is not overwhelming. A small cluster of chert flakes was also found between 20-30 m northwest of the site datum.

Artifacts found on the site include a chert, thin patterned biface or projectile point, a quartzite small, thin side-notched projectile point (5LA7409.0.2, Type P22), a non-bipolar core of quartzite, and a quartzite retouched/utilized flake. Thirty-nine flakes were found with the tools with the following material types -- chert (19), quartzite (18), and argillite (2). Opuntia, juniper, bunch grass, grama, cholla, yucca, and Indian paint brush were growing on the site when it was recorded. Soils are thin and there does not appear to be much opportunity for finding intact buried remains.

5LA7410 - This is an eligible site; for a full description see Chapter III.

5LA7411

The site is on a mesa/ridge top between a drainage and the slope to the plains on the west. A quartzite non-bipolar core fragment, a quartzite patterned flake tool that may be a drill tip, an argillite, flaked and battered core/tool, and a large, thin patterned biface that may be a projectile point fragment were found on the site. Surface flaking debris included 16 quartzite flakes, 10 chert flakes, four basalt flakes, two limestone flakes, one argillite flake, and one chalcedony flake.

The site has diverse materials on its surface, and although there are an estimated 30 cm of soil deposits in places, the potential for finding intact buried deposits is minor. No fire features were noted, and no architectural features were apparent. The site does not warrant further research.

5LA7412

The site is located on a ridge just above a major drainage overlooking grasslands to the southwest. The surface lithics consist of six quartzite flakes, two chert flakes, one basalt flake, and one obsidian flake. A single, exhausted, non-bipolar core made of chert was noted among the debris. No additional work is recommended for the site.

5LA7413

The site is located on the southwest edge of the Black Hills. The vegetation at the site is mostly juniper and a few cholla. The hill on which the site is located gradually slopes to the southwest. There is a good view of the grassy plains. The site measures 30 m north to south and 15 m east to west in an area of less than one-tenth acre. No tools were found on the site nor were any features identified. Flaking debris consists of 14 quartzite and 10 chert flakes. No further work is warranted at this small site.

5LA7414

The site is a sparse lithic scatter near the crest of a mesa. Artifacts from the site include the base of a projectile point, a biface fragment, and obsidian. The projectile point specimen (5LA7414.0.3) is classified as a P28 type and has associated dates of 2000 B.C. to A.D. 1000.

The site is located approximately 30 m northeast of 5LA7413. Juniper, cholla, lemonade bush, and prickly pear are growing on the site.

Flaking debris consists of five quartzite flakes and a single obsidian flake. No features were noted. The site is not significant and does not warrant further work.

5LA7415

The site consists of a concentration of flakes; Sites 5LA7413 and 5LA7414 are located approximately 100 m to the north. The site sits on a relatively flat area with slopes to the south and west. Twenty-four quartzite flakes and three chert flakes were found on the site. A single chert (possibly silicified wood) corner-notched projectile point fragment was recovered from the site. No features were found, and no additional work is recommended.

5LA7416 - This is an eligible site; for a full description see Chapter III.

5LA7417

The site is a scatter of historic, 20th-century household trash and a lesser quantity of more modern military trash. The site includes Feature 1, which is a rock enclosure created by raising bedrock slabs on edge and stacking smaller pieces of tabular stone in small columns in a rectangle.

Household material, estimated to date at 1940s to 1950s, was found with military material from the 1980s to 1990s. The glass included a pint bottle of clear green glass, machine made, with a stippled base “ 7 (Circled letter “I” within diamond shape) 3/16/E1911/Duraglass” and a Pepsi bottle, 12 fluid ounces, Pepsi Bottling Company, Wichita, Kansas “DES. PAT. 120277/ 14 B 52/ L-G 209-5.” Construction material included wire and cut nails. The site is not old and not significant. It may represent the location of a cow camp.

5LA7418 - This is an eligible site; for a full description see Chapter III.

5LA7419 - This is an eligible site; for a full description see Chapter III.

5LA7420 - This is an eligible site; for a full description see Chapter III.

5LA7421 - This is an eligible site; for a full description see Chapter III.

5LA7422

The site is located on eroded slopes leading to an unnamed drainage of Sugarloaf Canyon. A small area near the site center is flatter than other terrain, but it generally slopes. Lithics are scattered over an area of 1.34 acres. Chipped-stone debitage includes 59 flakes, of which 47 are quartzite, 9 are chert, two are argillite, and one is basalt. The tools are one quartzite retouched/utilized flake and one quartzite core. The ground-stone assemblage consists of two

manos, one of which is irregular and the other is oval. The site exhibits shallow deposition that indicates a low probability of encountering intact buried cultural deposits. Coupled with the lack of thermal features, the site warrants no further investigation.

5LA7423

This site is a disperse lithic scatter with two rockshelters. The site is located on a ridge top and the eroded slopes leading down to an unnamed drainage into Sugarloaf Canyon. The lithic scatter is relatively light and dispersed and mostly confined to the ridge top. The two rockshelters are located on the slopes of the drainage near the top. Shelter 1 has a wall feature extending out from a vertical rock ledge. The enclosed area measures 2.5 m by 2.25 m. Shelter 2 may have also had a wall feature associated with it, but it appears to have been badly eroded. It apparently measured 2.7 m by 2 m. Several metates and manos were found on the slopes below the rockshelter.

Surface flaking debris that was analyzed on the site was not very extensive. It included 11 quartzite flakes and one argillite flake. The chipped-stone tools include two crude, unfinished quartzite bifaces and a quartzite retouched/utilized flake. The ground-stone artifacts are seven metate fragments and one heavily used mano. The site exhibits rather shallow deposition, indicating a low probability of encountering intact buried deposits. There were no surface indications of thermal features, and artifact count and density were moderate. No temporally diagnostic artifacts were recovered.

5LA7424

The site is located on a low ridge top and gentle slope leading toward a drainage. The lithics on the ridge include 17 chert flakes, 11 quartzite flakes, and seven silicified wood flakes. Silicified wood flakes on the ridge top may indicate tool manufacture/maintenance. The stone-tool assemblage consists of one chert thin patterned biface, one silicified wood patterned biface, and one quartzite retouched/utilized flake. One of the bifaces (5LA7424.0.1) is classified as a projectile point and is typed as a P35. This artifact suggests an occupation range from the Late Archaic Stage to the Middle Ceramic Stage. Six small sherds were also found on the ridge top. Heavy weathering on the exterior surfaces makes any further classification difficult.

On the slopes leading to the drainage were found what may be a deflated hearth next to an outcrop of kaolinite. Several pieces of burnt kaolinite debris were found clustered around the outcrop. Forty-one pieces of kaolinite had flake characteristics, and it seems likely that the area was used to procure kaolinite and to process it (through reduction) for use or further refinement elsewhere.

Juniper, cholla, yucca, grama grass, and opuntia are found on the .862-acre site. Soils are thin, and although there was a deflated hearth found, it is not in an area where buried deposits are expected. The ceramics are an important artifact class. Perhaps more important is the outcrop of kaolinite and the potential for processing it on the site. This is an important resource which may

have been an attraction to the Black Hills region. Since there is little opportunity for finding buried cultural deposits, the site is not a good candidate for further work.

5LA7425

The site is a diffuse lithic scatter located on a ridge top. Artifact density is light, with about 5 m between flakes. Activity at the site was most likely lithic reduction. Of the 28 flakes examined in the field, 17 were quartzite, 10 were chert, and one was basalt. Two chipped-stone tools recovered from the site are chert. Of these, one is a crude, unfinished biface and the other is a large, thin, patterned biface. No ground-stone tools or fire features were found.

Part of the site (southernmost) extends into a previously surveyed block, but this site is defined within an area of about one-third acre. Based on the lack of evidence for intact buried deposits, no additional research is recommended.

5LA7426

The site is a lithic scatter located between two low north-south ridges on the flat of an unnamed drainage of Welsh Canyon. The site is bounded on the northeast by a relatively steep drop-off to the canyon. The southern edge has a gradual slope leading to the ridge/mesa top. Overall artifact density is relatively low, but a rather high density of flakes was located near the site datum. A quartzite core was also found about 30-40 m to the west of the site datum. It appears that some type of core reduction may have occurred at the site. The remaining chipped-stone tools consist of one unfinished chert biface and one patterned chert end scraper.

Flaking debitage consisted of 49 quartzite flakes and three chert flakes. No fire features were noted. No ground-stone tools were found.

5LA7427

The site is located on two slopes by a drainage (on the east side of the site, around 120°). Its boundaries were determined by the extent of the lithic scatter. Artifacts found at the site consist of lithic reduction flakes. Chipped-stone tools were not found, and there were no ground-stone tools or features on the site. The nine flakes were made of quartzite (8) and chert (1). Vegetation associated with the site includes juniper, various grasses, yucca, opuntia, cholla, and salvia. Additional research is not warranted.

5LA7428

The site is at the bottom of a slope along the side of a mesa. The small lithic scatter, covering about one-quarter acre, is in a clearing with mainly grama grass and prickly pear as the vegetation. Juniper surrounds the clearing. Neither chipped-stone tools nor ground-stone tools were found, and no features were identified.

The surface lithics consisted of 15 flakes, eight of quartzite, six of chert, and one of quartz. Soils are thin, the scatter is diffuse, and no additional work is recommended.

5LA7429

The site is a moderately sized lithic scatter of mainly chipped-stone debitage; two metates and a mano were also identified. The site is located on a slope near a major drainage that runs into Welsh Canyon. Site 5LA7419 is located approximately 50 m due west of this site along the same drainage, but we have no apparent reason, except proximity, to relate the two sites.

A total of 92 flakes were analyzed in the field and found to be made of quartzite (53), chert (30), basalt (6), argillite (2), and quartz (1). Three projectile points made of chert were collected, and one is unidentifiable as to type. The other two points (5LA7429.0.3 and 5LA7429.0.4) are typed as a P18 and P6. The remaining stone tools are a quartzite core and one small chert preform. Grama grass, prickly pear, yucca, and juniper are growing on the site, which encompasses an area of 4.42-acres.

5LA7430

The site is a low-density lithic scatter along a slope leading north up and out of the drainage at the headwaters of the unnamed stream flowing south down into and through Welsh Canyon. Thirty-five flakes were analyzed on the site; they are made of quartzite (23), chert (11), and basalt (1). The chipped-stone tool inventory was small, but it includes a chert, medium-size corner-notched projectile point (5LA7430.0.3, Type P53) with one side of its tang missing, a chert, end/side scraper, and quartzite corner-notched projectile point (5LA7430.0.1, Type P35).

Juniper, cholla, opuntia, yucca, and different kinds of grasses are found growing within the nearly three-quarter acre site. Soils are thin, however, and no fire features were found. No additional work is recommended.

5LA7431

This small site, encompassing less than .183 acres, is a lithic scatter with 17 flakes identified on its surface. Fourteen of the flakes were quartzite and three were chert. The site is located on a ridge top, with a low ridge above the site to the west. The artifacts are at a low density, with about 8-10 m between each flake. Just northeast of the site datum was a light concentration of debitage, but there are no associated fire features. The site is insignificant.

5LA7432

Six quartzite flakes and a single quartzite bifacial core-tool were noted on this small lithic scatter. The site sits in a shallow gully at the head of a small drainage that feeds into a larger one to the southwest of the site datum. No features were identified. Soils are thin, and the site debris is diffuse (artifacts are about 10-12 m apart). The site is not worthy of further work.

5LA7433

The site sits in a gully between two rock ledges (ledges on east and west sides of site). A dense concentration of debitage was found about 20 m to the south of the site datum. Another light concentration was noted about 70 m to the north of the site datum. Both concentrations were connected by a light distribution of flakes. The southern concentration was mostly quartzite simple flakes, while there was a relatively high proportion of complex flakes in the northern concentration. In total, sixty-one pieces of debitage were analyzed and found to consist of 55 quartzite flakes and six chert flakes. No feature numbers were assigned to the concentrations, and no other features, such as hearth remains, were identified. The two tools, both quartzite, include a large patterned biface and a retouched/utilized flake. The biface is further classified as a Type P79 projectile point with associated dates between A.D. 1000 to A.D. 1750. Additional work is not recommended.

5LA7434

The lithic scatter is slightly larger than one-quarter acre. It had a total of 155 flakes examined on its surface and was found to be made predominantly of quartzite (147), with minor amounts of chert (4), argillite (3), and basalt (1). The site is located in a gully of a minor drainage. Just above the slope, a mano and a metate were located. Artifacts in the slope and drainage consist of large and small flakes mainly of quartzite. An area of burnt kaolinite, measuring approximately 5.5 m in diameter, was located in the southern part of the site. It is believed to represent a kaolinite processing area, although there is no outcrop in the immediate area. A larger worked piece of gray kaolinite was found on the northern part of the site.

Chipped-stone tools include three non-bipolar cores (1 quartzite, 1 chert, and 1 argillite), two retouched/utilized flakes (1 quartzite and 1 black chert), and two large, crude and unfinished chert bifaces. The ground-stone tools include a broken, shallow-basin shaped metate, a broken oval-shaped mano, and a complete oval-shaped mano. All three are made of sandstone.

Juniper, opuntia, cholla, rhus trilobata, and piñon pine are growing on the site which is found within an area of .124-acre. The site is small. Soils are not well-developed and there is only minor opportunity for finding any significant information through excavation at the site.

5LA7435

The site is located on a ridge top below an elevated knoll to the south-southeast. The site is a diffuse lithic scatter with mostly quartzite flakes (23), but we did find a medium-sized chert core, one chert flake, and one argillite flake. Vegetation on the small site (.124-acre) is dominated by juniper, with lesser amounts of opuntia, yucca, mountain mahogany, cholla, and piñon pine. Soils are not well developed, and no features were found. The site is insignificant.

5LA7436

The site consists of a very sparse lithic scatter with 31 flakes. Most (23) were cortical and quartzite, while four were chert. No tools were identified. The site is located among the juniper trees on the mesa top near the southern edge where drainages on each side of the mesa top converge with a major tributary of Welsh Canyon. Isolated find 5LA7838 is located upslope approximately 50 m, but the site is small and not significant.

5LA7437

This site consists of a widely dispersed scatter of lithics, including tools. Within the site are three concentrations of lithics, each very discrete and of much greater density than the site as a whole. Each concentration is numbered as a feature. Feature 1 is located at the western edge of the site and just outside the stand of juniper trees with which the site also seems to be associated. Feature 2 is located within the stand of junipers toward the center of the site. Feature 3 is at the eastern edge of the site and the junipers. The site seems to be in an area of erosion, with overburden depths as little as 5 cm. The grassy field just north of the site has depths of at least 30 cm, while the junipered area to the south has depths of at least 20 cm. Some animal burrowing has taken place across the site, but for the most part, it was unnecessary to rely on these for locating artifacts, which were openly exposed on the ground surface. This site is located on the southwest gradual slope of the Black Hills, between two unnamed streams which flow southwest, draining into the north branch of the unnamed stream which flows south to join the unnamed stream passing through Welsh Canyon. Although not obvious on the USGS map, a small southwest-inclined drainage lies a short distance east of the site.

Unfortunately, no temporally diagnostic tools were found. The identified tools include a small argillite patterned flake tool, a quartzite retouched flake, and a quartzite non-bipolar core. The flaking detritus was dominated by quartzite (76), with chert (4), and argillite (4) flakes making up the remainder. Juniper, cholla, mountain mahogany, yucca, opuntia, foxtail, and Indian paintbrush were noted on the site at the time of our visit. No additional work is planned for this site, but it is one that should be watched if archaeologists return to the area. The depth of the soils suggests there may be buried deposits.

5LA7438 - This is an eligible site; for a full description see Chapter III.

5LA7439

The site is located on a ridge/mesa top about 50 m west of the eroded slopes of a drainage that leads into Welsh Canyon. It is relatively localized and the artifact density is low -- about 5 m between flakes. There is a combination of quartzite (15), chert (4), and single flakes of petrified wood and basalt. This site may be associated with site 5LA7426, which is located on the eroded drainage slopes about 70 m to the east. No tools were found on the site, and no features were identified. The soils are not well developed and the site is insignificant.

5LA7440

The site is a localized lithic scatter composed of two stone tools, one piece of ground stone, and one chert flake. The site is located on the eroding slopes of the head of a drainage of Sugarloaf Canyon. The site may be associated with site 5LA7423 (located 80 m northwest and/or site 5LA7422 (located 200 m northwest). The two chipped-stone tools include a chert, retouched/utilized flake and a chert flake tool. A piece of ground stone found at the site is a broken granite mano with an oval-shape. No features were noted. The site is insignificant.

5LA7441

The site is on a flat spot on a elevated mesa/ridge top situated lower than the surrounding ridges. It is between an upper side branch of Welsh Canyon and the first drainage next to the two-track road. Flaking debris, analyzed on the surface, is made of quartzite (58), chert (12), and obsidian (1). The chipped-stone tools include a large corner-notched projectile point base that may have been re-used or adapted into a hafted scraping tool, an end/side scraper of Alibates-like material, and a quartzite core.

Juniper, grama, opuntia, yucca, and cholla are growing on the site, and although it encompasses an area of 1.78-acres, there are no areas with the potential for intact buried deposits. The obsidian and the possible Alibates materials are of interest, but the site is not a good candidate for additional research.

5LA7442

Six flakes (4 chert and 2 quartzite) were found on the site, which is confined to an area of about .035 acres. No tools were found in the flaking debris. No fire features were seen on the site. It simply represents one of the hundreds of small scatters of chipped-stone debris that are found in the PCMS. No additional work is recommended.

5LA7443 - This is an eligible site; for a full description see Chapter III.

5LA7444

This is a small (three items), discrete lithic scatter on a gradual slope down to the south. The site is associated with a low rocky outcropping on the slope which has little overburden, but areas around this rocky outcrop may have more depth. This slope drains to an unnamed stream that flows into the northern branch of the headwaters of the stream flowing through Welsh Canyon. Two of the three flakes are chert and the other is quartzite. Tools include a large stemmed projectile point made of argillite and heat altered, and an irregular quartzite core. The projectile point (5LA7444.0.10) is classified as a P8 type with no associated dates.

5LA7445

The site consists of a sparse scatter of debitage and stone tools that are located on a southwest-facing slope that extends down from a mesa/ridge top. A small drainage is located ca. 20 m east of the site, which overlooks Welsh Canyon to the west. Material types for the chipped-stone debitage are quartzite (16), silicified wood (1), chalcedony (1), and chert (1). An unclassified chalcedony projectile point fragment and a quartzite unifacial tool were also collected. Neither ground stone nor thermal features were identified. Vegetation on the relatively small (50 x 40 m) site included juniper, grama grass, yucca, and opuntia. No further work is recommended.

5LA7446

This is a very low density lithic scatter that includes an Archaic projectile point (5LA7446.0.1, Type P7). It is on the edge of a small, dissected hill slope above and at the edge of the east side of a south-flowing, unnamed, intermittent, and currently dry stream. This stream feeds the north branch of the head of the unnamed stream through Welsh Canyon. The stream is in a deeply cut arroyo with steep sides. Another arroyo, perhaps less deeply cut, is located about 80 m east of the eastern edge of the site. The site is actively eroding, with cactus and yucca replacing the grama grass and forbs. Surface flaking debris included three chert flakes and one quartzite flake.

5LA7447

The site consists of a small and discrete cluster of flakes on a small shelf or bench just above a small, unnamed, south-flowing, intermittent stream (steep canyons on its west side) that serves as part of the northern arm of the headwaters of a drainage through Welsh Canyon. The artifacts include a chunky block of local quartzite in combination with very large flakes that suggest a localized lithic procurement site or perhaps an early-stage lithic reduction activity area. A historic fence crosses the north end of the site. It consists of native sandstone slabs piled around the base of juniper wood. No evidence of wire was found. The fence is aligned roughly east to west across the hill slope contours.

A total of 12 flakes were analyzed at the site and found to be made of quartzite (10) and chert (2). No tools were found. The site is not significant.

5LA7448 - This is an eligible site; for a full description see Chapter III.

5LA7449

The site is a sparse scatter of flakes on the flats of a small mesa. It is approximately 200 m northwest of a large drainage that includes site 5LA7448. The mesa rises a little more to the northeast. Three pieces of chert and one of quartzite were recovered. The site also contains one utilized flake, made of quartzite, with retouch along one margin. No fire features were noted. The site is one of the small lithic scatters that are common in the region, and it is not significant.

5LA7450

The site is situated on top of the edge of a drainage. The extent of the lithic scatter determines the site boundaries. Artifacts indicate that lithic reduction was the primary activity at the site. Vegetation consists of juniper, opuntia, cholla, yucca, grasses, and skunkbush. Site dimensions are 6 x 12 m. Eleven pieces of quartzite and one of chert were recorded on the site. No tools or features were recorded. The site is not significant.

5LA7451

The site is located on a slope by the top of a drainage (east side of the site). Boundaries are defined by the extent of the lithic scatter. Artifacts found indicate that lithic reduction and tool manufacture were activities at the site. Juniper, cholla, various grasses, opuntia, yucca, and skunk bush characterize vegetation around the site. The site, which covers more than three acres, has scattered surface artifacts. A total of 91 pieces of debitage were analyzed and found to be manufactured from quartzite (73), chert (14), argillite (2), basalt, (1), and chalcedony (1). Three non-bipolar cores, of which two are quartzite and one is chert, were found at the site. Of the stone tools that were collected, one is an Archaic projectile point base (Type P6) made of Polvadera Peak obsidian (Figure 12), one is an irregular quartzite biface, and one is a basalt preform tip. No features were identified, and the site is not eligible for the National Register.

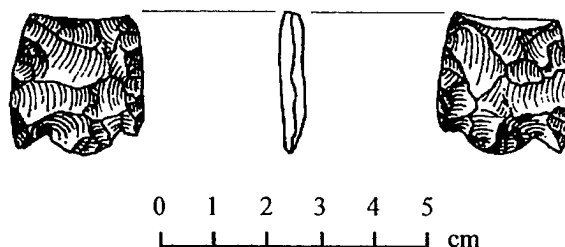


Figure 12: P6 projectile point from the surface of 5LA7451.

5LA7452 - This is an eligible site; for a full description see Chapter III.

5LA7453

The site is comprised of a large, fairly dense scattering of lithics. The site itself runs roughly north-south between the caprock at the top of the ridge and a drainage to the east. Lithic density is highest near the datum and to the northern and southern ends of the site. Vegetation on-site is composed mainly of opuntia, grama and bunch grass, juniper, yucca, and some cholla.

Chipped-stone tools include an argillite retouched flake with working along one margin; an exhausted quartzite non-bipolar core; an exhausted and utilized bifacial chert core; an exhausted chert non-bipolar core; a large unfinished patterned chert tool that may be a biface or a core fragment; a thin argillite projectile point (5LA7453.0.6, Type P27); two quartzite unfinished bifaces; a quartzite thin patterned biface or very large corner-notched projectile point (5LA7453.0.3, Type P21), possibly used as a tanged-knife; a basalt unfinished biface; and a quartzite flake tool. A single broken fragment of a flat metate was also noted. Flaking debris is made of 156 items consisting of quartzite (125), chert (26), argillite (4), and basalt (1).

Although there were a relatively large number of artifacts on the site, the soils are thin, there are no fire features, and the opportunity for further work is not good. The site is believed to be not significant.

5LA7454

The site is among outcroppings of large sandstone boulders, with site 5LA7453 approximately 20 m to the southwest. This site is in the clearing between the boulders. It includes flakes, a core, and a metate fragment. The flakes are made entirely of quartzite with 26 recorded. The stone tools are a quartzite bifacial core-tool, a quartzite non-bipolar core, and a chert non-bipolar core. The broken metate is made of sandstone. No fire features were noted. Soils are thin, and the site does not warrant additional research.

5LA7455

The site is comprised of one mano and one lithic. The site sits on a slope above jutting areas of bedrock. Local vegetation consists of bunch and grama grasses, opuntia, juniper, and cholla. The chipped-stone flake is made of petrified wood. The quartzite mano is oval shaped, with two ground surfaces. No features were found on the site, and no additional work is recommended.

5LA7456

The site is on a slope just above caprock that is above a large section of large chunks of sandstone. A small drainage is adjacent to the site, which has a moderate stand of juniper. Fifty-four quartzite, seven chert, and one basalt flake make up the surface chipped-stone debris. A single non-bipolar, exhausted, chert core was found. Additional work is not recommended for the site.

5LA7457

The site is located on a slope by the edge of a drainage (east side of the site). Boundaries are defined by the extent of the lithic scatter. Artifacts consist of lithic reduction detritus including flakes of quartzite (9), argillite (1), and chert (1). No tools were found. Vegetation at the site presents juniper, cholla, opuntia, yucca, and grasses. It is not significant.

5LA7458

The site is located on a ridge between two drainages, oriented north-south. Boundaries of the site are determined by the extent of the lithic scatter. Artifacts found at the site represent lithic reduction and food processing activity. Vegetation at the site and surrounding area is characterized by juniper, piñon, opuntia, cholla, grasses, and yucca.

The ground-stone tools include a complete oval-shaped mano and two metate fragments. All are made of sandstone. No chipped-stone tools were found. Flaking debris, looked at on the site, consists of 22 quartzite and one chert flake. No additional work is recommended.

5LA7459

The site is on a ridge between two drainages. It is small, measuring about one-tenth acre, but it contains a fairly dense lithic scatter. The stone debitage includes 29 quartzite and eight chert flakes. No tools were found and no fire features were noted. The soils are thin and the site does not appear to have any potential for additional research.

5LA7460

The site is located on top of a ridge between two drainages on a sloped area. Boundaries are determined by the extent of the lithic scatter. The artifacts found at the site indicate that lithic reduction was one activity carried out there. Vegetation at the site and in the surrounding area presents juniper, piñon, yucca, opuntia, cholla, and various grasses.

Chipped-stone debris is dominated by quartzite with 66 flakes, while only four of chert were found. Two exhausted, non-bipolar chert cores were found with a small, thin, chert biface that was probably a projectile point preform. With the dominance of quartzite in the flaking debris, the use of chert for the tools is noteworthy. No features were found. Soils are thin, and the site does not appear to have intact cultural deposits.

5LA7461

This small site, covering about two-thirds of an acre, contains 27 pieces of debitage -- quartzite (20), chert (6), and basalt (1) and three tools. The tools include a side-notched projectile point (5LA7461.0.1, Type P46) that is heavily patinated and Archaic in age, and two quartzite fragments of the same utilized flake. A broken sandstone mano was also found on the site.

This low-density lithic scatter is located on a gradual slope above the north side of Welsh Canyon. It is located on the dissected western edge of a larger southwest-trending ridge line which forms the north-central edge of Welsh Canyon. Site 5LA7461 is situated on this dissected western edge on a small ridge that, on the Stage Canyon 7.5', sheet looks like a duck's head. This ridge is bordered on the north by an unnamed, south-flowing stream, part of the head of

Welsh Canyon. A small canyon without a stream marks the south edge of the ridge. Even though a diagnostic tool was found, the site is not considered significant.

5LA7462

This site consists of stone flakes and tools scattered in moderate density on a small hilltop and its eastern slope. This hill and slope are one small arm of a dissected ridge line formation which extends roughly to the southeast to form part of the northern edge of Welsh Canyon. To the west of the site is a long slope down into Welsh Canyon. To the south of the site is a dry canyon. Over the site, but in no definite pattern, fire-cracked rock of local sandstone is evident.

Artifacts include two quartzite, non-bipolar cores; two chert, retouched flakes, one of which has heat exposure; one quartzite retouched flake; a kaolinite, crude unfinished biface; a quartzite, unfinished biface; a chert, crude and unfinished biface; a quartzite bifacial core; a quartzite tool with retouch along its dorsal and ventral faces; a large, thin, chert biface; and a patterned, micro-flake with scars along its ventral face. The chipped-stone debitage was made up of 101 pieces of quartzite (73), chert (13), argillite (10), basalt (4), and petrified wood (1). The artifacts have a moderate density in the half-acre site. Although the site has some merit, it is not a good candidate for additional research.

5LA7463 - This is an eligible site; for a full description see Chapter III.

5LA7464

This small (7 x 5.5 m) low-density lithic scatter is comprised of four quartzite flakes and one unfinished quartzite biface. The site is located on a mesa/ridge top west of an unnamed canyon edge. There is an estimated 40-50 cm of soil deposition at the site, but there was no surface evidence for the presence of thermal features, nor was any ground stone noted. No further work at the site is recommended.

5LA7465

This site is a sparse lithic scatter located on the ridge/mesa top. The site is situated between the canyon edge to the north and a heavily eroded bedrock outcrop along the site's northwest edge. Juniper, yucca, cholla, opuntia, grama grasses, and *rhys trilobata* are growing on the site.

There are two major concentrations of artifacts. The densest concentration (chert and quartzite) is located 25 m to the east of the datum. A more sparse concentration (mostly quartzite flakes) is found 25 m to the west of the site datum. The total flakes are quartzite (61) and chert (2). A quartzite, retouched/utilized flake and a quartzite, non-bipolar core were on the site. In addition, a broken sandstone mano was noted. The site is not worthy of further work.

5LA7466 - This is an eligible site; for a full description see Chapter III.

5LA7467

The site consists of a dense scatter of lithics on a flat mesa top. Cholla, yucca, juniper, opuntia, native grasses, and *rhus trilobata* are growing on the less than half-acre site. The chipped-stone debris includes 127 quartzite flakes, 17 chert flakes, three basalt flakes, and one argillite flake.

The stone tools include a non-bipolar core and a crude bifacial core or core-tool. Both are quartzite. No diagnostic tools were found. Deposition is fairly substantial, ca. 30-35 cm, and may be burying a fair number of artifacts, but the site is located at an unlikely spot high on the mesa top and 100 m from the canyon edge. No additional work is recommended.

5LA7468

The site is a very sparse lithic scatter located just east of the canyon edge on top of, and on the east slopes of, a small knoll. Artifact density is very low, with artifacts spaced at about 10 m apart (perhaps more). Lithic reduction and perhaps plant processing are the main activities that we can infer from artifacts. Flakes are mostly quartzite (23) with some chert (3). A single large quartzite biface was found on the site. No additional research is recommended.

5LA7469

This site is a sparse lithic scatter located on the ridge/mesa top. While the information as a whole is fairly sparse, there is a rather dense concentration of artifacts located approximately 32 m south of the site datum. Another less dense concentration is located 39 m southeast of the site datum. The presence of an edge-ground mano and a metate indicate that plant processing was an activity at the site.

Seventy-two flakes were found, consisting of quartzite (65), chert (5), chalcedony (1), and quartz (1). The single chipped-stone tool was a quartzite bifacial core-tool. Additional research is not warranted.

5LA7470

This site is a sparse lithic scatter located on the ridge/mesa top at about 100 m east of the canyon edge. It is located at the base of a low bedrock outcrop situated about 15 m to the southwest, and a 4-x-4 m area of ashy soil with fire-cracked rock (Feature 1) is located about 5 m southeast of the site datum. Some lithics were found eroding from this feature. Deposition is variable, with some areas eroded down to bedrock and others maintaining about 25 cm of deposition. Flaking debris was dominated by quartzite, with lesser amounts of chert and argillite. No temporally diagnostic artifacts were recovered.

5LA7471 - This is an eligible site; for a full description see Chapter III.

5LA7472

The site is a lithic scatter located on a sloped area close to a two-track road. The site boundaries were determined by the distribution of the surface lithics. Vegetation at the site is characterized by juniper, opuntia, yucca, cholla, and different kinds of grass. Stone tools included a large hornfels/basalt core, a retouched quartzite blade, and a quartzite end scraper. The flaking debris consisted of quartzite, chert, hornfels/basalt, and argillite. These were scattered over an area of about one-third acre.

5LA7473

This site is a low-density lithic scatter located on the end of the ridge separating two major drainages: Sugarloaf Canyon and Welsh Canyon. The site is just inside the Welsh Canyon drainage. No features were noted on the site nor were any temporally diagnostic artifacts recovered. The single chipped-stone-tool was a chert retouched flake; it was found among the few flakes of quartzite and hornfels/basalt.

5LA7474

This site consists of a low-density scatter of lithic artifacts on the ridge separating Welsh Canyon from Sugarloaf Canyon. The setting is just inside the slope of the Welsh Canyon drainage. The artifacts tend to concentrate near the center of the site, where we placed the datum, with increasingly lower densities farther out from the datum.

Twenty-six flakes were recorded on the site. These are dominated by quartzite (23), with small numbers of basalt (2) and chalcedony (1). It is unusual not to find chert on the surface of sites in the region, and its absence on this site is unexplained. No tools were recorded, and no features were observed.

5LA7475

The site consists of a fairly dense lithic scatter centralized around a bedrock outcrop that runs roughly north-south. The main lithic concentration is just east of the outcrop, with a second smaller scatter just west of the outcrop. The second scatter may be the result of erosion from the eastern side of the outcrop. Vegetation on-site is mainly grama and bunch grass, opuntia, yucca, cholla, and juniper.

Two quartzite cores, a chert biface fragment, and a single irregular chert corner-notched projectile point were found on the site. The flaking debris was dominated by quartzite. No features were found, and no surface ground stone was recovered.

5LA7476

This site consists of a high density of gray quartzite flakes with a much lower density of more variable lithic material around the edges of this cluster. This cluster corresponds to a natural outcropping of this same material. Also, the flakes are at times nondescript and accompanied by gray quartzite shatter. This suggests that the site was used for procurement and early-stage reduction of this material. This site is situated on the slope above and southeast of a small drainage that feeds eventually into Welsh Canyon. The ridge line separating Welsh Canyon from Sugarloaf Canyon is 0.5 km northeast of the site.

Four quartzite cores found on the site support the contention that it once served as a procurement area. No features were found, and no temporally diagnostic tools were recovered.

5LA7477

The site is composed of a disperse lithic scatter sitting on a gentle slope with red rock exposed in places. Some clustering of lithics is present, but no obvious reason for these clusters could be determined. Vegetation is mainly bunch and grama grasses, opuntia, cholla, and fairly dense juniper. The site covers an area of .516 acres. A single broken biface made of quartzite was noted, although the surface chipped-stone detritus included chert, quartzite, and hornfels/basalt.

5LA7478

This site consists of a highly localized scatter of lithics above and at the west edge of a south-trending stream channel, which drains the ridge that separates Welsh Canyon (in which the site lies) from Sugarloaf Canyon. The site is undergoing erosion that is active enough to be notable and readily apparent. The site drains to the southeast.

Quartzite and chert flakes were noted on the surface in a small area that measures 7 m by 14 m. No features were noted, and there were no areas that suggested potential for recovery of buried deposits.

5LA7479

This site consists of two discrete scatters of lithic artifacts, one very close to the other. Both are located at the southern toe of a south-trending ridge between two southeast-flowing unnamed streams that serve a larger unnamed stream which serves Welsh Canyon. One cluster is slightly further out on the toe than the other and at a slightly lower elevation. The site encompasses an area of 2,477m².

No features were noted on the site, but four metate fragments were found on the surface as well as dozens of quartzite flakes and a few chert flakes. A single quartzite core was noted, but no other patterned tools were found.

5LA7480

The site consists of a small scatter of lithics that have been exposed by erosion along a small drainage. A large argillite biface, an irregular small quartzite (possibly chert) side scraper/uniface, and an exhausted chert core were found. Twenty-three of the flakes were quartzite, and the remainder was chert (4). No fire features or grinding tools were found. Soils are thin, and the site does not offer potential for additional research.

State Site Numbers 5LA7481 through 5LA7486 were not assigned to this project.

5LA7487

This site consists of a low density of lithics with a couple of moderate density clusters associated with erosion. Both chipped and ground stone are present. The north end of the site is within 30 m of a small southwest-trending drainage that flows into a major northern arm of Welsh Canyon. Cholla, grama, opuntia, and juniper are found on the site.

Chipped stone is dominated by quartzite (64), with lesser amounts of chert (20), basalt (2), and argillite (1). The tools include an irregular retouched flake made of quartzite and an irregular retouched biface made of chert. Ground-stone tools include a broken sandstone mano. No features were found. The site is not significant.

5LA7488

The site consists of a very sparse scatter of lithics. Lithic scatter 5LA7480 is located approximately 60 m to the northeast of this site, and it is possible that the two are associated. Neither site is significant, however. Site 5LA7488 encompasses an area of 433 m². In this area, seven flakes, three quartzite, three chert, and one basalt were found. No tools were found, no features were noted, and the site is not significant.

5LA7489

The site consists of a sparse lithic scatter of quartzite flakes. The artifacts are located at the edge of a tree line approximately 60 m from an unnamed drainage of Welsh Canyon. Surface flaking debris is made of 17 quartzite flakes with no other materials. No tools were found. The small site, measuring 797 m², is indicative of the many scattered groups of chipped-stone detritus that are found in the PCMS.

5LA7490

The site is situated by the edge of a drainage and on top of the ridge on a sloped area. The drainage is unnamed, and it is a major tributary stream of Welsh Canyon. The north, west, and south areas present exposed bedrock. The east side presents the major concentration of lithic scatter. Artifacts indicate lithic reduction and food processing as activities carried out at the site. Boundaries are determined by the lithic scatter and confined within an area of about two-thirds

acre. Vegetation at the site is characterized by juniper, cholla, opuntia, yucca, and different kinds of grass and brush.

The chipped-stone debitage is made of quartzite (91), chert (7), basalt (2), and quartz (1). Tools include a hornfels/basalt, early-stage projectile point preform; a chert, unfinished biface; two quartzite cores, one of which is exhausted; a chert core fragment; a tested chert gastrolith; and a quartzite flake with retouch along one margin.

The ground-stone tools include a beautifully shaped, oval mano with pecking around the entire circumference. The "down" side was covered with a caliche so thick and extensive that it was not possible to tell whether that side was also used/ground. A fractured metate was recorded that has an area of 15 x 12.5 cm near the center of one surface that displays more wear than other areas of the artifact. Although the overall shape is irregular, the area of grinding is oval.

The site lacks fire features and good soil deposits. Further work is not recommended.

5LA7491 - This is an eligible site; for a full description see Chapter III.

5LA7492

The site consists of a moderate concentration of flakes and a few sparsely scattered lithics outside of the major concentration. The major concentration is located 27 m south-southeast of site datum, but only 12 quartzite flakes are found on the site. Deposition appears to be at least 15 cm in the main part of the concentration, but the lack of evidence for fire features makes the site a poor candidate for additional research. The site is located on the mesa top, approximately 50 m west of a point that looks out over Welsh Canyon.

5LA7493

This site is a sparse lithic scatter located on a low bench off the mesa top. The bench is located at the head of a major drainage that heads south. Artifact density is rather low, and there are no major artifact concentrations. A small hearth composed of fire-cracked rock and ashy soil was found 10 m southeast of site datum; however it is located within a shallow, eroded gully. We noted a few bifacial-thinning flakes among the 37 total flakes. Material types are quartzite (31) and chert (6). Vegetation on the site included juniper, mountain mahogany, yucca, *rhys trilobata*, cholla, opuntia, blackfoot daisy, piñon pine, and black grama grass.

Two rusty tin cans of recent manufacture were found among the prehistoric tools. The latter include a large thin chert biface (Type P42); two quartzite flake tools; one quartzite retouched flake; a quartzite non-bipolar core; and a quartzite crude bifacial core-tool. The tools were not concentrated near the hearth. Deposits do not appear to be well developed, and the expenditure of additional resources on the site is not recommended.

5LA7494

The site is a sparse lithic scatter located on the badly eroded slopes leading down to a drainage (that eventually dumps into Welsh). Deposition is shallow, with exposed bedrock predominating. Most of the debitage consisted of large flakes, possibly indicating that the smaller pieces were washed down the drainage. Artifact density is fairly low, with no distinct clusters. The analyzed flakes include 31 pieces of quartzite and six of chert. The presence of ground stone indicates that plant processing may have been an activity carried out at the site. The site is also located adjacent to a stand of gamble oak (possible resource). Other plants include juniper, mountain mahogany, cholla, yucca, opuntia, grama grass, and rice grass. These probably account for the ground-stone tools, which include a complete oval-shaped sandstone mano, a broken flat metate, and a broken flat metate or palette. The site is eroded and not a good candidate for additional research.

5LA7495

This site is a sparse lithic scatter located on a ridge top between two high rocky outcrops to the north and south. A shallow drainage is located off to the west. Juniper, piñon, mountain mahogany, *rhus trilobata*, yucca, cholla, and grama grass grow on the site, which is confined to an area of 546 m².

Artifact density is relatively low for much of the site with a small concentration east of the site datum. Artifacts, especially a number of chert flakes, appear to be eroding out of small gullies off to the west. The presence of two cores and a relatively high proportions of large, cortical, simple flakes may indicate that core reduction was an activity conducted at the site. The flaking debris was made of quartzite (13), chert (7), and argillite (1). Two large crude bifacial core-tools were recorded. The site lacks fire features, and even though there may be some buried remains, they are not believed to be significant.

5LA7496

This site is a relatively localized lithic scatter located on a ridge top with an ephemeral drainage. Juniper, cholla, yucca, opuntia, needle and thread grass, grama grass, and other grasses are growing on the site, which is contained within an area of 963 m². Artifact density is relatively high, with artifacts separated at an average of 0.5 m near the site datum. Artifacts are mostly quartzite (47) debitage with some chert (15) pieces. Lithic reduction is the only activity that can be inferred from artifactual remains. Based on the surface examination, we do not think the site contains intact buried cultural remains.

5LA7497

The site consists of a dense scatter of lithic material, approximately 50 flakes within an 18 m x 17 m area. Total flakes from the site include 118 quartzite and one quartz. The site is located on the mesa top at the edge of a canyon rim that drops a tributary drainage of Welsh Canyon 120 ft below. The purple-colored quartzite is likely from the same raw material source,

and that source is probably somewhere in the canyon or near the site. A single large retouched flake was identified, but no patterned tools were among the debitage. The site is not significant.

5LA7498

The site is located on the mesa top at the tip end of a finger that overlooks the Welsh Canyon two-track road. A relatively dense scatter of cultural material including a projectile point and several pieces of ground stone were located in a 20 m x 30 m area. The rest of the site contains a sparse to moderate lithic scatter. Flaking debris, analyzed on the site, was made of quartzite (49), chert (7), basalt (1), and argillite (1). In addition to the projectile point (5LA7498.0.5, Type P79), we found a quartzite patterned flake tool, a chert patterned biface (5LA7498.0.4, Type P50), two non-bipolar cores, one of chert and the other of quartzite, and a large quartzite bifacially prepared core-tool. The P79 type projectile point is shown in Figure 13.

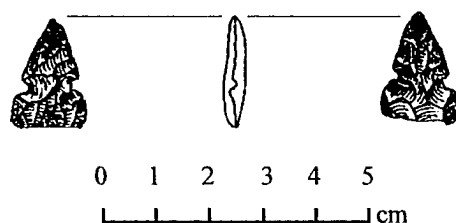


Figure 13: P79 projectile point from the surface of 5LA7498.

On the edge of the canyon rim to the northwest of the datum, we identified two manos and a metate. One mano was found broken into two pieces (FS 5 and FS 12). The two pieces were found about 30 m apart. Two more complete oval-shaped manos, and another two mano fragments were also found, as well as two complete edge-ground cobbles and two additional metate fragments.

Juniper, cholla, yucca, *rhus trilobata*, grama grass, opuntia, black foot daisy, and piñon pine are growing on the site, which is within an area of 1.25-acres. The large amounts of ground-stone tools are not unusual in sites overlooking the grassy side slopes of the heads of canyons. These areas support abundant stands of Indian rice grass and other cheno-ams that were staple food products when they were in season. Unfortunately, we did not find places where there may be intact buried cultural remains on the site.

5LA7499

This site is a sparse but localized lithic scatter located on a ridge/mesa top. The site is composed of eight pieces of debitage situated within a 2.6 m x 3.5 m area. Seven are quartzite and one is chert. The flakes were exposed in an area disturbed by animal activity. Deposition is

about 25 cm; so some artifacts may be buried. Nonetheless, the site is not considered significant.

5LA7500

The site consists of a moderate scatter of flakes measuring 50 m x 45 m. No tools or diagnostics were identified, but the diverse material types in the debitage include 49 quartzite, seven chert, one basalt, and one argillite flake. The site is located on the flat mesa top near the canyon rim, 35 m east, amidst thick juniper scrub. We noted a high proportion of complex flakes that may indicate the final stages of lithic reduction as an activity at the site. The site does not have research potential.

5LA7501

The site is a localized lithic scatter situated on the point of a mesa top that overlooks Welsh Canyon to the southwest. The point sits 400 m above drainages located on both the east and west sides of the mesa top. Two quartzite non-bipolar cores were found near site datum. One of these has end battering, suggesting it may have been used as a hammering tool. Other flakes include 15 of quartzite and nine of chert. There is very little deposition on the site, and most soil has probably washed down into the canyon below. The site is not significant.

5LA7502

The site is a lithic scatter composed of eleven flakes, located on mesa top approximately 50 m north of the head of a drainage. Artifact count and density are relatively low, with an average of 5-8 m separating each flake, but the flakes are made of diverse materials -- quartzite (4), basalt (4), argillite (2), and chert (1). No tools were found among these flakes. No features were noted on the site. The site is not significant.

5LA7503

The site is located on a mesa top along the edge of an unnamed drainage, which lies 380 m below. A point that overlooks Welsh Canyon is located 100 m south of this site. The site consists of a moderate lithic scatter of 24 flakes, with 20 quartzite and four argillite. One argillite non-bipolar core was recorded, but no diagnostics were identified. A metate and one mano fragment were located that are both sandstone. The argillite core together with the argillite flakes may indicate that the core was being reduced on-site. Soils are not well developed on the site, and it is not a good candidate for additional research.

5LA7504

This site is a sparse but localized lithic scatter located on the ridge/mesa top about 15 m west of a steep-sided drainage that feeds into Welsh Canyon. The site was composed of five quartzite flakes and one retouched/utilized quartzite tool. No features were identified. The vegetation on the small site, encompassing 73 m², includes juniper, yucca, opuntia, cholla, piñon, and grama grasses. No additional work is recommended.

5LA7505

Sixteen quartzite and three chert flakes were found on this site, which is classed as a sparse lithic scatter. Located on a ridge/mesa top, a small, minor drainage is situated along the east side of the site. Artifact density is relatively low, with a somewhat separate artifact concentration located at about 15 m west of site datum. Lithic reduction can be inferred from the debitage found at the site, but there are no areas where more information could be learned by additional research.

5LA7506

The site consists of seven quartzite flakes in a small cluster (2 x 1.5 m). All of the flakes appear to have been removed from the same core. The view from the location is good, and apparently someone sat there, at some point in time, and reduced a core into useable flakes for stone tools. The site is one of many like it in the region, and it is not significant.

5LA7507

This site consists of the wreckage of a World War II military aircraft, which crashed on a training flight. The plane was of all metal construction with an aluminum skin. It appears to have been in military configuration based on paint remnants and the aluminum and the presence of a "U.S. ARMY SIGNAL CORPS" radio aboard. The site is in a narrow, north-trending (approximately 310°) canyon, which is one of the branches of Sugarloaf Canyon. Vegetation at the site presents juniper, yucca, opuntia, cholla, and different kinds of grasses.

An isolated projectile point was found at the edge of the drainage and within the primarily historical site. The projectile point is a P42 and dates between 1500 B.C. to 1000 B.C. No other prehistoric remains were located at the site.

Though site 5LA7507 is a large aircraft wreckage that has some associated documentary information and would be useful for documenting artifact dispersion, no further work is warranted.

5LA7508

The site consists of four chert cores, one chert flake and 15 quartzite flakes. Gray quartzite nodules and some chert is found in the outcrops at the site area, but at least three of the white quartzite flakes appear to have been transported to the site. The site is encompassed in an area of slightly more than a half acre. Vegetation on the site includes opuntia, juniper, yucca, grama grasses, and rabbit bush. Soils are thin and features were not evident. The site is not significant.

5LA7509 - This is an eligible site; for a full description see Chapter III.

5LA7510

The site consists of a sparse scatter of lithics. No diagnostic tools were identified. The chipped-stone detritus is made of 17 quartzite, two basalt, and two chert flakes. No features were noted. The soils are thin, and the small site is not worthy of additional research.

5LA7511

The site consists of a scatter of flakes and two ground-stone artifacts. The artifacts are located on the margin of a drainage that allows access to Bent Canyon to the east. Flaking debris is dominated by quartzite (20), with lesser amounts of chert (9), and basalt (2). Artifacts found include a quartzite core and a chert core. The ground-stone tools include a round sandstone mano and a bedrock metate area in the sandstone outcrop with measurements of 25.5 cm by 34 cm. Juniper, yucca, cholla, grama, and opuntia are found on the site, which is encompassed in an area of slightly more than one-third acre. Soils are thin and no features were found. The site is not significant.

5LA7512

The site consists of a moderately dense scatter of lithics with a comparatively high tool to flake ratio. It is very discrete, found in an area of 482 m², and not associated with any special erosional feature or exposure. It is located on open ground on a gradually south-trending slope in an area of open grass cover toward the center of a north-trending ridge which forms part of the southern edge of Sugarloaf Canyon. Flaking debris, analyzed on the site, included 20 quartzite, nine chert, and two basalt flakes. Tools include two quartzite cores, a chert core, an unfinished quartzite biface, and two corner-notched projectile points. Only one of the projectile points (5LA7512.0.2) could be classified under Anderson's (1989) system. This specimen is similar to the P59 type which has associated dates from between A.D. 500 and A.D. 1200. A metate fragment was also noted.

Soils depths are shallow, and no fire features were evident. The site does not appear to have potential for additional research.

5LA7513

The site consists of a scattering of flakes and ground-stone artifacts that occur predominately on exposed bedrock at the head of a small unnamed drainage. A small amount of heat-altered stone was observed in the vicinity of metate FS 5 (broken in two pieces). Two fragments from the same biface were collected approximately 5 m apart. Flaking debris is made up of 17 quartzite, four basalt, and three chert flakes. In addition to the broken quartzite biface, an exhausted quartzite core, an exhausted chert core, an irregular chert core fragment, and a hornfels/basalt core fragment were found. The ground-stone tools include a quartzite metate fragment and two sandstone metate fragments. No manos were noted. Juniper, yucca, grama,

mountain mahogany, opuntia, and cholla are growing on the half-acre site. No further work is recommended.

5LA7514

This site consists of a low-density lithic scatter situated on a gradual slope just above the head of an east-trending drainage at the east side of a north-trending ridge which forms the south side of Sugarloaf Canyon. The scatter includes at least one cluster of moderate to high density, but the significance of this concentration is not evident.

Flakes include 33 quartzite, 15 chert, and two hornfels/basalt. The tools recovered among the flakes include a crude, heavily patinated hornfels/basalt biface and a non-bipolar core or flaked gastrolith, possibly quartz. Soils are thin, and no fire features were evident. The site is not a good candidate for additional research.

5LA7515

A chert non-bipolar core and a P54 type projectile point were found in this lithic scatter. Flaking detritus included 16 quartzite flakes and three chert flakes. Other artifacts include three sandstone metate fragments, all of irregular shape in their fragmented condition. The site is located down a north-south-trending drainage on a north-south-trending mesa, 120 m to the south of Sugarloaf Canyon. The site is located mainly on the slopes of the drainage. Soil deposits are thin, and there do not appear to be locations for buried cultural remains.

5LA7516

The site is located in a flat area of the mesa top at the base of a hill located just north of the site. A sparse scatter of artifacts including a metate and one stone tool were identified in an open field of predominately cheatgrass. The site is situated in a relatively flat area at the base of a low ridge to the north of the site.

The single tool is a retouched/utilized quartzite flake. It was collected from debitage that consists of 15 quartzite, six chert, two limestone, and one argillite flake. The shallow-basin metate is a fragment representing less than half the original artifact. No features were noted, and the site is not important.

5LA7517

This site is a sparse lithic scatter located on the ridge/mesa top. The site is situated near the canyon edge (which is located ca. 15 m to the east). Surface flaking debris on this site is more diverse than many of its neighbors. Although small in total number, the 21 flakes were made of quartzite (13), chert (4), argillite (2), chalcedony (1), and basalt (1). A single large retouched flake made of quartzite was recovered among the flaking debris. No features were found however, and without time-diagnostic tools or the potential to recover datable materials, the site is not significant.

5LA7518 - This is an eligible site; for a full description see Chapter III.

5LA7519

The site is located about 30 m south of a two-track road. It is composed of a light scatter of tin cans and two pieces of brown-glazed stoneware and several shards of purple glass. Intermixed with this is a prehistoric component that consists of a light lithic scatter and a mano. This part of the site consists of only four pieces of quartzite debitage, one mano, and a large thin patterned biface made of obsidian that could be an Archaic-age projectile point fragment. The obsidian specimen was sourced to the Cerro del Medio area of the middle Jemez Mountains of New Mexico. The oval-shaped sandstone mano is complete. The site is disturbed by relatively modern (1900s) historic trash, and there are few artifacts. Further work is not recommended.

5LA7520

This one and one-third acre site consists of a sparse scatter of lithics in a 120-m-x-80-m area located on a mesa top approximately 100 m south of the Black Hills two-track. Considerable deposition of up to 30 cm in many areas exists throughout this part of the mesa top. The majority of artifacts found consist of lithic flakes of chert (18) and quartzite (42) material, but also there is some hornfels/basalt (1) in a group of thinly scattered flakes.

Broken glass shards from a historic age (1900s) bottle or jar were noted on the site. The prehistoric artifacts include a single large crude quartzite bifacial core-tool. A broken oval-shaped sandstone mano piece was also found. Juniper, yucca, cholla, opuntia, stipa grasses (New Mexico feather and needle and thread), and grama grasses are growing on the site. Even though there are some areas of good soil development, no evidence of fire features was noted. The site is believed not to be a good candidate for additional research.

5LA7521

This site is a diffuse lithic scatter located at the base of a rock ledge that forms the western edge of the site. Artifact density is low (ca. 10 m between each artifact), and no major artifact concentrations were noted. Artifacts indicate that lithic reduction was the primary activity carried out at the site. Flakes of quartzite (25), chert (5), and argillite (1) were recorded. No chipped-stone tools were found, but several historic artifacts including a fragment of a cylindrical, machine-made, clear brown glass bottle were noted. Part of its side wall included upper curvature for the base. It has no markings or label, but it is probably a beer bottle. In addition, one milk can, a soldered lid and base with sanitary side seam (2.5 inches in diameter and ca. 2 3/8 inches high) was noted, a .22 short; "U" headstamp cartridge that had been fired, and a sheet iron canister lid were found. None of the artifacts is significant. No further work is recommended for the site.

5LA7522

The site is located on mesa top and extends approximately 40 m east to the canyon rim and a small point that overlooks an unnamed tributary drainage of Welsh Canyon, 200 m below. Artifacts are located on a shallow bedrock terrace between point and rim and extend northwest. As the site extends northwest, deposition increases to approximately 35 cm in places, although bedrock outcrops are found throughout site. A quartzite corner-notched projectile point (5LA7522.0.01) was located in an area of high deposition. This specimen was classified as a P26 and has associated dates of 1000 B.C. to A.D. 500. Flaking debris, analyzed on the site, is made of quartzite (39), chert (4), and argillite (2). A sandstone fragment from a flat metate was also located.

Juniper, mountain mahogany, yucca, opuntia, galleta grass, stipa grasses, and other grasses grow on the site. Even though it has areas of good soil development, the proximity of bedrock and the erosional nature of the setting make it a poor candidate for any more research.

5LA7523 - This is an eligible site; for a full description see Chapter III.

5LA7524

The site is small, covering less than a quarter of an acre. Within that area, a concentration of 89 quartzite flakes was found with a single large quartzite retouched flake. Flakes are overwhelmingly small and made of a white quartzite (over 90%) that could possibly be from a single core. The site is located on the mesa top at the canyon rim. The rockshelter on the previously recorded site 5LA6862 is located in the canyon below the site and thus could be associated. Juniper, cholla, yucca, opuntia, grama grasses, snakeweed, and piñon are growing on the site. Aside from its possible association with the rockshelters, the site does not have any special significance.

5LA7525

The site is located on a south-facing bench below a "finger" mesa top adjacent to Welsh Canyon to the south. It consists of tested cobbles and flakes that are dominated by quartzite (17), with lesser amounts of chert (2), and quartz (3). A quartzite cobble outcrop is present at the site, suggesting the site is a source area for the material. Deposition is shallow, and artifacts are mostly the debris from testing small quartzite cobbles (large cortical flakes). Two non-bipolar quartzite cores were noted. No further work is recommended.

5LA7526

No tools and only six flakes were found on this sparse lithic scatter located between two minor drainages. Five of the flakes are quartzite, and one is basalt. Deposition is shallow, with bedrock outcropping on site. In the absence of diagnostic artifacts and features, the site is not significant.

5LA7527

The site is a localized but sparse lithic scatter located on the ridge/mesa top about 15 m east of canyon edge. The scatter is composed of quartzite (5) and chert (4) debitage and one broken quartzite biface. Artifacts indicate that lithic reduction was an activity carried out at the site. Artifact density is moderate, with an average of about 3 m separating each artifact near site datum. No hearth remnants were found. The site does not have diagnostic artifacts, and it lacks potential for establishing its age.

5LA7528

The site is composed of the remains of a wood-framed shack and a very light scatter of historic debris. Associated artifacts include window glass, a tin can, and a small propane tank. The wood-frame foundation is still visible, and wall remains can be seen scattered around the foundation. A propane can at the site may represent the most recent use of structure, while other artifacts suggest use in the past 100 years.

The site exhibits shallow deposition, indicating a low probability of encountering intact, buried deposits. The structure was fairly ephemeral and rested on the surface. Artifact count and density were low, and there is no indication of a midden area. The site is not significant.

5LA7529

The site is a moderate scatter of 22 flakes -- 17 quartzite, four chert, and one quartz. Neither chipped-stone nor ground-stone tools were identified. The site is located on the north side of the main two-track road into the Black Hills on a north-south ridge along a mesa top. Sugarloaf Springs is one ridge to the west. Deposition is fairly shallow, 5-10 cm. Dense juniper scrub is found on site, but it does not appear to be concealing intact cultural remains. The site is not significant.

5LA7530

The site is a sparse lithic scatter located on the ridge near the canyon edge overlooking an unnamed drainage 250 ft below. It extends from a well-eroded gully in the western part of the site up to a low knoll on the eastern part of the site. Vegetation is dense near the canyon, with piñon and rice grass present. Soil is shallow in most places on the site, and bedrock is exposed closer to the canyon rim. Chipped-stone artifacts include a late prehistoric side-notched projectile point (5LA7530.0.3, Type P70) made of chalcedony; three chert cores in various stages of modification; two crude, quartzite bifacially prepared core-tools; a quartzite irregular-shaped core; and a quartzite flake tool. A single broken edge-ground cobble made of sandstone was also noted. The flaking detritus analyzed on the site is made of quartzite (18), chert (4), and argillite (1).

A rockshelter is located off the northern edge of the site. Two flakes were found in front of the shelter, but it does not appear to have good potential for buried cultural remains.

5LA7531

The site consists of a sparse scatter of lithics that occur near the center of a small north-south trending ridge. No diagnostic tools were located. The chipped-stone debitage consisted of nine chert, six quartzite, and one petrified wood flake. No evidence of features was noted. Juniper, yucca, *rhys trilobata*, opuntia, and cholla grow on the site, but the soil development is moderate. Buried remains are unlikely.

5LA7532

The site consists of a large, bifacially reduced quartzite core-tool and a single chert flake. Juniper, yucca, and needle and thread grass are growing in the immediate site area, which encompasses 12 m². The site is not significant.

5LA7533

The site consists of a light diffuse lithic scatter on a mesa top on exposed sandstone bedrock. Lithics consist of one quartzite projectile point (5LA7533.0.1, Type P20) and one fragment of a probable chert projectile point. Both were collected. Quartzite (6) flakes outnumbered chert (2) and basalt (2) flakes. Deposition is very shallow, with bedrock outcropping all around the site datum. Most of the artifacts were found resting on bedrock. Additional work is not recommended.

5LA7534

The site consists of a light, very diffuse lithic scatter with one utilized quartzite flake, a crude argillite core-tool, and assorted debitage on the north-northeast-sloping top edge of a mesa south of Sugarloaf Canyon. Artifact density is about 5 m between each artifact near site datum. Deposition is shallow, and deposits are eroding downslope. The flakes are made of the following material types: quartzite (12), chert (2), and argillite (1). A complete oval-shaped sandstone mano was also found. With no soil deposition, the site is not a good candidate for additional research.

5LA7535

The site consists of a light diffuse lithic scatter facing the north edge of a mesa top to the south of an unnamed drainage southeast of Sugarloaf Canyon. The tools consist of a small-shaped metate with two fragments, an adjacent quartzite mano, and an argillite uniface tool, as well as miscellaneous chert (2), quartzite (14), and basalt (3) flakes. A rotted wooden stake and two old pin flags were found, but we do not know their origin. Juniper, piñon, mountain mahogany, *rhys trilobata*, yucca, New Mexico feathergrass, cholla, and opuntia are growing on the one-third-acre site. No features were noted, and soils are not well developed. The site is not significant.

5LA7536

The site consists of a sparse lithic scatter on the east-facing edge of a mesa/ridge to the south of Bent Canyon and overlooking an unnamed drainage to the east. Lithics include basalt (3), chert (4), and quartzite (19) flakes, including a retouched flake (FS 1) and a biface fragment (FS 2) both collected. The latter may be a portion of a broken projectile point. Both collected specimens are made of hornfels/basalt. Juniper, piñon, yucca, cholla, opuntia, side-oats grama, and other grasses grow on the site, which is contained in an area of .187 acre. No additional work is planned.

5LA7537

The site is located on a point that overlooks Bent Canyon. The highest density of artifacts is on the south side of the point to the mesa edge which overlooks a steep drainage. A natural seep was located in the drainage bottom. The site contains stone tools and ground-stone artifacts. A datum previously placed at the site was located 4 m west of our datum, but we recorded the site because there was no indication of a recorded site at this location on any map available to us.

Flaking debris is extensive, with 150 flakes analyzed in the field. They are made of quartzite (119), chert (24), argillite (3), basalt (3), and siltstone (1). Tools found include a quartzite irregular biface, two chert cores, and a quartzite core. The ground-stone inventory is greater than the chipped stone; it includes 2 complete slab metates made of sandstone and one broken metate of limestone. Hand tools include a complete oval-shaped sandstone mano and a broken quartzite edge-ground cobble. The site and artifacts are contained within somewhat less than an acre, but no areas were located where we thought there might be buried deposits.

5LA7538 - This is an eligible site; for a full description see Chapter III.

5LA7539

The site is located on a south-facing bench between two ridges to the north of Welsh Canyon. Artifacts consist of two complete oval-shaped manos, one broken slab metate fragment, miscellaneous flakes (quartzite - 4; chert - 1), a single tested small quartzite nodule or core, and a flaked chert core or gastrolith. No evidence of former fires was noted. Soils are thin, and the site is thought not to be significant.

5LA7540

The site is located on an east-facing slope, beneath a saddle, below ridge tops on a south-trending mesa north of Welsh Canyon. The site consists of miscellaneous flakes of chert (5) and quartzite (4). The scatter erodes down the bench and trails over sandstone ledges to the valley floor and into an unnamed drainage to the northeast. Small quartzite cobbles are eroding from the sandstone ledges and out of a narrow band of conglomerate below. The site may represent a raw material procurement area, but evidence is sparse. No additional work is recommended.

5LA7541

The site consists of a cluster of lithic artifacts with a few lithics scattered around this concentration. The material types of the lithics are quartzite (34), chert (7), argillite (1), and chalcedony (1). A side-notched projectile point fragment (quartzite) and two retouched flakes were collected. The projectile point (5LA7541.0.1) conforms to Anderson's (1989) P83 type and has associated dates between A.D. 750 to A.D. 1650. One of the flakes is quartzite, and the other is a heat-treated chert or a chert from a non-local source. Grama, juniper, yucca, cholla, opuntia, and various grasses are growing on the site. Soils are thin, though, and the site is not a good candidate for additional research.

5LA7542

This site is a dispersed lithic scatter located on the mesa top. Artifact density is somewhat low, about 4-5 m apart near datum and more dispersed at the periphery of the site. Material types include quartzite (16), chert (9), hornfels/basalt (3), and argillite (1). Neither chipped-stone nor ground-stone tools were found. The site is not significant.

5LA7543

The site consists of six flakes in a small cluster. No tools or other diagnostic artifacts were identified. The artifacts are largely chert shatter (4) and two quartzite fragments. The site area is contained within 36 m². No additional work is planned.

5LA7544

This site is a lithic scatter with moderate artifact density. Around the site datum the artifacts are about 2-3 m apart, but the artifact density falls off at the perimeter of the site. Small flakes predominate, and cortical flakes are somewhat uncommon near datum. The material types are quartzite (16), chert (11), and argillite (1). One surface chipped-stone tool is a large exhausted quartzite core. Flakes near the area where the core was noted are large, perhaps indicating freehand core reduction. The other artifact is an irregular-shaped retouched flake/tool. Soils are thin, and no evidence of former fires was noted. The site is not significant.

5LA7545

This site consists of three retouched/utilized quartzite flakes. The artifacts were found on the east edge of the Black Hills immediately north of a small unnamed side drainage. No other cultural materials could be found in the site area, which is encompassed within 20 m². No additional research is warranted for the site.

5LA7546

The site consists of five lithics in a small cluster. The lithics consist of four large, simple quartzite flakes and one simple chert flake. No tools were found on the small site that is encompassed in an area of 20 m². Soils are thin, and it is unlikely that there is a buried site location. No further work is recommended.

5LA7547

This site is a large, but dispersed lithic scatter situated on an east-west-trending ridge. The ridge is narrow, trending north to south, and the site nearby extends from about 50 m from the southern edge of the ridge to about 40 m from the northern ridge edge. Flakes are difficult to characterize. Quartzite debitage presents a mixed bag of flake size, type, and cortical combinations. Artifact density is variable, with several somewhat moderate concentrations (flakes about 4-5 m apart) separated by about 10 m. The chipped-stone assemblage contains 51 quartzite flakes, eight chert flakes, and one hornfels/basalt flake. No tools were found, and the site is not worthy of additional research.

5LA7548 - This is an eligible site; for a full description see Chapter III.

5LA7549

This is a large lithic scatter located on the ridge top and encompasses 10.4-acres. The site is located on the east and west sides of the Black Hills two-track road, and it is likely associated with 5LA7548. Juniper, cholla, opuntia, grama grass, *rhus trilobata*, purple three-awn, sage, mountain mahogany, snakeweed, and blackfoot daisy were growing on the site in July when it was recorded.

The site extends eastward nearly to the edge of Welsh Canyon where a bedrock metate with three grinding surfaces was located on the west side of the road along with more scattered chipped-stone detritus. One complete oval-shaped mano and three broken ones were found with four metates/grinding surfaces. The abundance of the ground stone, with a total of more than a square meter of exposed grinding surface, suggests that plant processing was an important subsistence activity carried out at the site.

Flaking debris from the site is made of quartzite (110), chert (31), basalt (5), argillite (3), and chalcedony (1). This mirrors the material types for neighboring site 5LA7548 and points toward a possible association between the two. Chipped-stone tools include two chert and two quartzite non-bipolar cores; one large, crude, bifacially prepared quartzite core-tool; two quartzite retouched flakes; two quartzite and one chert patterned flake tools; a quartzite unfinished biface; and a quartzite thinned Type 2 biface.

The site is not recommended for additional research, but its location in proximity to 5LA7548 should be kept in mind. The two sites may be related.

5LA7550

The site consists of an extensive scatter of flakes and ground stone that is located on the north side of an unnamed side drainage of Bent Canyon. A historic trash scatter is located on the northern edge of the site. Three manos (two oval-shaped and one irregularly-shaped) and a small metate fragment were identified. One mano is limestone, two are sandstone, and the metate fragment is quartzite. The diversity in the materials suggests the site was an area of grinding activities. Feature 1 is a cluster of lithics that measure 18 m x 5 m, located on a small bench on the south side of the site.

Four cores were found in Feature 1, and all artifacts from Feature 1 were recorded separately. The cores from the feature include three quartzite non-bipolar ones and a quartzite large crude bifacial core/tool. Another irregular-shaped core, made of chert, was found on the site, outside the feature area. Flaking debris on the site is made of quartzite (107), chert (34), chalcedony (4), basalt (4), argillite (2), limestone (1), and petrified wood (1).

Clear glass (Mason, patent August 5, 1919 (whole/ with cap)), other glass jar and bottle pieces, whiteware, a coffee cup, plain and whiteware dinner plate pieces; and various cans were found in the trash. It is recent and not significant.

Cholla, juniper, opuntia, grama grass, yucca, blackfoot daisy, and mountain mahogany grow on the 6-acre site. Other than the concentration of chipped stone, no prehistoric features were noted. No good areas to test the site were evident, and the site is not recommended for additional research.

5LA7551

The site is a large lithic scatter situated on the southern edge of the head of a tributary drainage to Bent Canyon. The head of the drainage is bifurcated, and the site area extends from this bifurcation to the southeast, approximately 250 m. Several northwest-trending small washes or gullies drain the upper part of the site. The site lies on the south slope of a southwest-northeast-trending unnamed drainage. It extends upslope to a large floodplain, but does not continue very far onto the floodplain. The site is dominated by juniper stands, with other plants including grama grass, cholla, yucca, snakeweed, sulfur flower, mountain mahogany, and piñon.

Bedrock is deteriorating and eroding to the surface. There are two major areas of lithic concentration with intermediate isolates. A midden, or burned area, of fire-cracked rock and ash that measures 17 x 13 m was identified. A quartzite biface tip and a quartzite biface mid-section, two chert side-notched projectile points, two quartzite, one chert and one limestone non-bipolar cores were recorded, as well as one crude bifacial core-tool and a retouched flake of quartzite. Both projectile points (5LA7551.0.3 and 5LA7551.0.4) are classified as Type P79 and date to the Ceramic stage.

Surface flaking debris is made of quartzite (76), chert (60), basalt (5), and quartz (2). The ratio of chert to quartzite is high when compared to nearby sites. Ground-stone tools include a

broken sandstone metate. The site is exposed through erosion and not considered significant. Areas of intact deposits are not likely.

5LA7552

The site lies on east side of a small unnamed drainage on a slope. The east boundary of the site is defined by 6-ft-high rock outcroppings. Junipers dominate the vegetation, with many areas of eroded bedrock. A possible rockshelter exists on the eastern boundary; however, rock fall and vegetative overgrowth preclude even casual study. Two flakes were found downslope from the shelter. Small drainages appear to be the mechanism for transporting large quartzite flakes downslope, through soil erosion and run-off. No temporally diagnostic artifacts were observed, but the tools include three quartzite cores. Flaking debris is made of quartzite (41), chert (1), and hornfels/basalt (1). The site is not significant.

5LA7553

The site consists of a large scatter of lithic artifacts that are located on the east side of an unnamed side drainage of Bent Canyon. A historic component was found within the site area. The lithics at the site were predominately purple quartzite flakes, and only two quartzite cores and a single-notched projectile point (5LA7553.0.1) were identified. The tip of the P56 type quartzite point is reworked, possibly into a drill.

The sample of 160 lithics was recorded in a 50-m-x-20-m area in the vicinity of the datum. This large sample, analyzed in the field, is made of quartzite (135), chert (16), chalcedony (3), argillite (2), with one flake each of hornfels/basalt, quartz, limestone, and petrified wood.

The historic component of site 5LA7553 consists of a foundation remnant, a corral, and a heavy historic artifact scatter. A large unnamed drainage lies 120 m to the south. The site is situated on a large floodplain. Artifacts include sanitary cans, window glass, bottle glass, nails, wood, and household goods.

Neither the prehistoric component nor the historic component is believed to be significant. The historic materials are recent and duplicated in many other locations with much better integrity, and the prehistoric materials do not appear to be intact in a buried context.

5LA7554

This is a small, somewhat localized lithic scatter located on a ridge top. The south site boundary extends to about 10 m from a Black Hills two-track road. Welsh Canyon is located to the east. The site is composed of chipped-stone debitage of purplish gray quartzite (22 flakes are quartzite and two are chert). Two retouched/utilized flakes and a corner-notched projectile point (5LA7554.0.2, Type P62) were found. All are quartzite. Artifact density is moderate around the site datum, with a 3-4 m distance between flakes, but the site does not exhibit any clusters of flakes or features that are worthy of test excavation. No further work is recommended.

5LA7555

The site consists of a sparse scatter of lithics. The site is located between 5LA7553 and 5LA7554. No chipped-stone tools were identified. The lithics at the site consist largely of purplish gray quartzite, with 33 quartzite, six chert, and a single chalcedony flake found on the site. No features were noted. The site is not significant.

5LA7556

This site is located on a bench that extends about 80 m north-south by 70 m east-west, below the upper portion of the ridge top. The site is located at the northeast edge of the terrace. The chipped-stone scatter is somewhat moderate, with a total count of 50 flakes spaced about 4-5 m apart near the site datum. Flakes are mostly quartzite (44). Chert (3), argillite (1), and hornfels/basalt (2) are also represented. A structure, Feature 1, is collapsed and somewhat dubious; it is constructed of large 1-x-1-x-.60-m sandstone blocks. Some of the rocks making the structure appear to be upright, and two of the rocks are stacked one upon the other. It does not have much deposition within the confines of the walls, and no artifacts were seen eroding out of the structure. A chert projectile point (5LA7556.0.1, Type P32) was found just south of the structure, and a quartzite retouched flake was found in the surface detritus.

The rockshelter is located off the northern point of the site. It measures 4.7 x 4.2 m, and a complete metate was found lying on the shelter floor. The metate was ground and pecked on a sandstone slab. Some pieces of relatively recent unburned bone were seen on the shelter floor near the metate, but no other artifacts were noted. Deposits appear thin.

The site is not considered a good candidate for additional research. The sandstone block feature may be natural, and if it is cultural, it does not contain deposits. The rockshelter is deflated. It is not a good site for productive research.

5LA7557

The site consists of seven quartzite flakes that are located on the edge of a small, unnamed side drainage of Bent Canyon. No chipped-stone or ground-stone tools were found. The entire site is within an area of 28 ft². No further work is recommended.

5LA7558

This site is a small localized lithic scatter located on the west of the ridge. Some rather tall piñon trees (4-10 m) are scattered about the site area. Artifact density is moderate around the datum, with 2-3 m spacing. Only purple and gray quartzite flakes (44) were found, and the only thing that can be inferred is lithic reduction. The flakes are large and may indicate pure freehand core reduction. No areas for buried deposits were noted. Additional research would not likely be productive.

5LA7559

This site consists of six large purple quartzite flakes that are scattered along a small bench on the side of the Black Hills. Site 5LA5660 is located approximately 60 m to the northeast on the opposite side of a small drainage. Several comparatively large piñon trees (4-7 m in height) were noted currently growing in the area. No evidence of former fires was noted. Even though this site has some soil depth, without any features or concentrations, searching for clusters of cultural material would be a daunting task.

5LA7560

This site is a lithic scatter located on a terrace above an eroded wash and on top of a low ridge. The site is near the edge of the ridge top overlooking Bent Canyon, and the portion of the site on the terrace is composed of mostly white quartzite chipping debris. This indicates that the location was probably used to manufacture stone tools. Some of the debris has washed down off the ledge onto the terrace below. The rest of the site is difficult to interpret, but consists mainly of purple quartzite debitage. Twenty-seven quartzite flakes constitute the entire site. Further work is not warranted.

5LA7561

This small site covers less than one-half acre. It consists entirely of surface flaking debris made of quartzite (7), basalt (1), and chert (1). No chipped-stone or ground-stone tools were found. No evidence of former fires was noted. The site is near the center of the eastern end of the Black Hills, approximately 120 m south of 5LA7551. It represents one of several similar sites in the vicinity and is not worthy of additional research.

5LA7562

The site consists of 25 flakes in a small and discrete cluster. This site has a higher proportion of chert (10) flakes than other lithic scatters in the vicinity. Other materials on the surface include quartzite (14) and basalt (1). The site is located at the center of the east end of the Black Hills, approximately 30 m north of the interior boundary fence. It is among many other scatters of chipped-stone debris in the region, with unknown functions. Additional work would not be productive.

5LA7563

The site consists of widely scattered flakes on top of the tableland/mesa of the Black Hills. The flakes are predominately quartzite (38), with a very small percentage of chert (6) and chalcedony (1). No tools were found. The site is located in the center of the east end of the Black Hills where it has several neighbors that are similar scatters of flakes without tools. Additional research is not recommended for the site.

5LA7564

The site consists of a small and discrete cluster of chert (3) and quartzite (7) flakes. The lithics are located on the edge of a small and shallow drainage. Three pieces of quartzite shatter appearing to be from the same nodule were found next to each other, suggesting core reduction at the location. No fire features were noted. No stone tools were found, and no additional work is warranted.

5LA7565

The site is a dispersed lithic scatter located on the west edge of a flat mesa in the Black Hills. Tools noted at the surface include two chert cores and the proximal end of a chert drill. Of the flakes, the majority is the local gray and purple quartzite (16), with some chert (5) and basalt (2) flakes intermixed. No features were noted. Juniper, opuntia, bunch grass, snakeweed, and yucca are growing on the site, but it lacks good soil depth. It is not significant.

5LA7566

This site is a small lithic scatter located on the ridge top about 50 m south-southeast of a small wash at the edge of the canyon. Piñon, juniper, opuntia, yucca, blackfoot daisy, and grama grass are growing on the site that has some areas with as much as 25 cm of soil deposits. The artifact density is somewhat moderate, with flakes being about 3-4 inches apart around the datum. Most of the flakes are quartzite (9), but a couple of chert (2) pieces and a basalt piece were also noted. An unfinished biface made of chert is the only tool recorded. No remains of former fires were noted. This site is not a good candidate for additional research.

5LA7567

Site 5LA7567 is a concentrated lithic scatter that is located on a gently sloping mesa top along the west edge of the Black Hills. All artifacts noted at the surface are flakes, with one mano represented. Of the flakes, the majority are made of local quartzites (84). However, a high percentage of the sample is chert (38) with lesser amounts of argillite (1), chalcedony (1), claystone (2), and limestone (1). The claystone is an unusual material that is seldom seen in flaking debitage in the region, but it is likely from a nearby source. The relatively large number of flakes without any recognizable tools is another unusual characteristic here. The oval-shaped sandstone mano is broken. No remnants of former fires were noted. The site is not significant.

5LA7568

The site is a sparse lithic scatter located above an unnamed drainage on the west edge of the Black Hills. The artifact inventory includes two retouched flakes made of quartzite. With 46 flakes, quartzite is the dominant material type; however, chert, with 29 flakes, is also well represented in the artifact assemblage. No features were found. The site is not significant.

5LA7569

This site is a small localized lithic scatter located on a ridge top near the crest. Artifact density is moderate, with spacing between artifacts of about 3 m, but there are only five flakes and two tools. The flakes represent four material types: argillite (2), chert (1), basalt (1), and quartzite (1). A large crude, unfinished biface made of quartzite and a quartzite projectile point were found; it is a large stemmed point, Type P28, and has associated dates that range from the Middle Archaic period to the Late Prehistoric period. No features were noted. This is a curious site with diversity in the material types and a projectile point, but no other tools. Unfortunately, it does not offer any potential for additional research.

5LA7570

This site is a small lithic scatter located on a ridge top near the crest. The scatter is small, with only four flakes, one of chert and three of quartzite, and one non-bipolar chert core fragment. The flakes are spaced about 4-5 m apart. Lithic reduction is the only general activity that can be inferred from the artifacts seen at the site. No features were noted. The site does not have good potential for additional research.

5LA7571

The site consists of a dispersed scatter of lithic artifacts with several small clusters of flakes. No time-diagnostic artifacts were located, but several tools, including a chert end scraper, a quartzite biface, a basalt core, and two quartzite retouched/utilized flakes were identified. One of the flakes has retouch along three margins. Surface flaking debris is made of quartzite (96), chert (1), basalt (1), and quartz (1). A fragment of a shallow basin-shaped sandstone metate was noted. No fire features were evident, and additional research is not warranted.

5LA7572

This site is a lithic scatter on the ridge top in an area of piñon and juniper patches interspersed with open grassy patches. The site is near the head of a drainage to a tributary to Welsh Canyon located southwest of the site datum. Artifact density is high near the site datum, with flakes spaced about 1-2 m apart. Two small projectile points (5LA7572.0.1 and 5LA7572.0.2) indicate a relatively late occupation (both are Type P62). One is chalcedony and the other is chert. A chert non-bipolar core was also identified and there are at least two chert bifacial-thinning flakes among the 20 chert flakes on the site, but most flakes are quartzite (66), with high frequencies of shatter. The chipped-stone debitage indicates a mixed bag of lithic reduction activities from initial stages to late-stage operation. No features were noted.

5LA7573

The site consists of a sparse scatter of lithic artifacts. Nine quartzite flakes and a single argillite flake were recorded. The site is located approximately 130 m to the east of site

5LA7572 and roughly 50 m to the north of a side drainage of Welsh Canyon. No tools were found and no features were noted. The site is not significant.

5LA7574

The site is a scatter of historic debris (cans, glass) in open grassy clearing. The area surrounding the clearing is wooded with juniper. The site slopes to the northwest. Feature 1, a stone pile with large slabs on top, possibly a hearth deflector or a windbreak, is associated with the scatter.

Some debris slopes off to the northwest into juniper. Artifacts include a galvanized wash basin (24" diameter, 10 ½" deep) with one handle, aqua bottle glass fragments (some melted), several cans; one hole-in-cap can with a double-puncture opening, a lard bucket (4 ¾" diameter, 5 7/8 " height) with no handle, one can 5" in height, unknown diameter, and cut around with a knife, and another about the same size, cut open with a can-opener. A galvanized open-top coffee pot with handle (7 ¾" deep, 7 ¾" diameter at base) is among the artifacts. The site is relatively recent and not significant.

5LA7575

The site is a sparse lithic scatter located on the ridge top. Artifact density is low, with artifacts spaced at about 10-15 m apart near the site datum. Topographic relief slopes down to the west of the site datum, and a small gully or wash can be found 15 m to the south of datum. A previously recorded site (5LA6858) is about 50 m to the west of the site datum. Chipped-stone debitage indicates lithic reduction was an activity performed at the site. Flaking debris is made of 6 quartzite flakes and 2 chert flakes. No tools were found. Deadfall juniper branches, apparently used in a small corral, were found with barbed wire and a tin can on the site. Neither the prehistoric nor the historic component is significant.

5LA7576

This site is a concentrated lithic scatter located on the ridge top. Artifact density is high, with flakes less than 1 m apart near the datum. Chipped stone shows a high number of chert (89) small flakes, but quartzite was a close second (70), with a single piece of argillite. This information, in addition to the presence of three tools, may indicate that the final stages of lithic reduction (i.e. tool maintenance/production) was an important activity at the site. We noted the presence of one hornfels/basalt flake that was not recorded on the chipped-stone debitage form.

The chipped-stone tools include a medium-sized quartzite, thinned and patterned biface, a small hornfels or basalt crude and unfinished biface, and a quartzite unfinished biface. Two modern sanitary cans were also found on the site. Juniper, grama grass, *opuntia phaeacantha*, *opuntia imbricata*, and broom grass are growing on the site. Soils are relatively thin, and no features were found. The site is not significant.

5LA7577

The site is a small lithic scatter located at the crest of a ridge top. The site is located about 10 m east of the Black Hills two-track road. Exposed bedrock outcrops in several places. The artifact density is low to moderate, with spacing between artifacts of about 3 m near the datum. Lithic reduction is inferred based on the presence of chipping debris. The chipped-stone material types include chert (1), argillite (1) and quartzite (29). A quartzite unfinished biface was found among the detritus, but no features were noted. The site is not significant.

5LA7578

This site is a small lithic scatter on the edge of the mesa overlooking Welsh Canyon. The site contains a large number of tools for its size, which is less than a half acre. The lithics are concentrated in a small area (10 m x 10 m), with a few scattered flakes around the margin, continuing onto a small unnamed side drainage of Welsh Canyon located to the south. Lithic materials include 41 quartzite flakes and 12 chert flakes. The tools are all made of quartzite. They include an irregular biface, a broken biface, a possible projectile point preform, a large crude and unfinished biface, a retouched flake, and an irregular-shaped core. No features were noted. The site does not have potential for additional research.

5LA7579

The site is located along the base of a low ridge on a mesa top. The flakes appear to have eroded out and washed down from above; however, no lithics were noted on the bench above, so lithics may be *in situ*. Nine quartzite flakes were identified along with two quartz and two chert flakes as the remainder of the counted materials. No tools were found. Parts of this site could be buried, but in the absence of any evidence for former fire features, it is not a good candidate for additional research.

5LA7580

The site consists of a small cluster of lithic artifacts that are located at the edge of a ridge overlooking Welsh Canyon. Several large piñon trees (maximum 10 m high) are present in the vicinity of the site. The lithics are made up of eight pieces of quartzite and one piece of chert. A single quartzite non-bipolar core was recorded. No evidence of former fires was noted. The site does not have potential for additional research.

5LA7581

The site is a large lithic scatter that is located on the ridge top. It extends about 400 m northwest to northeast along its long axis, and it is composed of several artifact concentrations linked up by a sparse scattering of lithic debris. The artifact density is moderate to high within artifact concentrations (artifacts at about 2-3 m apart) and very low between concentrations (10-15 m). The southeast boundary of the site is delineated by a slight drop-off into a small drainage, while the other edges are defined by the extent of lithics seen on the surface. Some areas of the

west edge are delineated by the mesa edge. Chipped-stone debris is mostly composed of large quartzite flakes (130), indicating that perhaps quartzite core reduction was an activity carried out at the site. Other materials include chert (17), chalcedony (1), basalt (1), and limestone (1). A large corner-notched point (5LA7581.0.1, Type P26) and a small possible projectile point (5LA7581.0.6, Type P49) indicate a Late Archaic to Ceramic stage occupation. Both are made of quartzite. Other tools include a chert flake tool, a quartzite flake tool, a possible Alibates chert unfinished biface, and a quartzite bifacial core-tool. This is a good and large site, but in the absence of any evidence of former fires, we do not believe it has strong potential for additional research.

5LA7582 - This is an eligible site; for a full description see Chapter III.

5LA7583

This site is a sparse lithic scatter located on a bench below the ridge top. The site is delineated on the east by the ledge marking the edge of the ridge top. The artifact density is very low, with spacing between artifacts at about 10 m near the datum. Chipped stone is mostly large quartzite (33) with cortex and two chert flakes. Chipped stone and presence of two quartzite cores perhaps indicate that quartzite core reduction was carried out at the site. A single retouched flake made of quartzite was also found. No fire features were noted. The soils are not well developed, and the site does not have strong potential for further work.

5LA7584

The site is a small lithic scatter located near the edge of a bench below the mesa top. It sits on a point of land overlooking Welsh Canyon. It is composed of large quartzite (7) flakes and a quartzite core, maybe indicating pure freehand core reduction/testing. Artifact density is moderate, with about 3 m separating flakes, but the number is small. No evidence of former fires was noted. Soils are relatively thin. The site does not offer potential for further research.

5LA7585

This site is a small localized lithic scatter located on the ridge top. Artifact density is high, with artifact spacing of less than one meter near the datum. Chipped-stone debitage seems to indicate a mixed bag of lithic reduction operations from core reduction to perhaps tool maintenance/production. The material types include quartzite (49), chert (14), and argillite (1). No stone tools were found in the detritus. The site is not significant.

5LA7586

This site is a small, but localized lithic scatter located on the ridge top. Artifact density is high, with artifacts spaced at around 2 m apart near the datum. Chipped-stone debitage is composed mainly of large simple quartzite flakes, which may indicate that quartzite core reduction was an important activity carried out at the site. A total of 61 quartzite flakes were found, with 21 chert flakes. No chipped-stone or ground-stone tools were found on the site.

Evidence for former fires was not noted. Soils are not well developed. The site is not a good candidate for further work.

5LA7587

This site is a small dispersed lithic scatter located on a bench/terrace below the mesa top. Artifact density is low, with artifact spacing about 5-6 m apart near the datum. A bifacial core-tool made of quartzite was found along with five quartzite and three chert flakes. No evidence of former fires was noted. No ground-stone tools were found. The soils are thin, and the site does not hold potential for additional research.

5LA7588

The site is a small dispersed lithic scatter located in a shallow drainage on a bench that is just below the mesa top. Artifact density is low, with artifacts spaced at about 4-5 m apart near the datum. The flaking detritus is made up of 10 pieces of quartzite, and from this, two quartzite bifacial core-tools and a quartzite retouched/utilized flake were recovered. No ground-stone tools were noted and no features were found. The site is not significant.

5LA7589

This is a small lithic scatter located on a terrace above Welsh Canyon. Exposed bedrock is seen in numerous places throughout the site. The site surface is generally level (1-3°) and slopes to the south, with a terrace down about 2 m from the mesa top to the north. The majority of the flakes were quartzite (21), with a few of chert (5). No tools are present. This small site only measures 24 m north-south and 26 m east-west. It is not significant.

5LA7590

The site is an open lithic scatter situated in a slightly open area overlooking an unnamed canyon and an unnamed drainage that flows into the Purgatoire River. The site is a wide and sparse scatter of flaking debris with ground stone. It is encompassed in an area measuring slightly more than one-third acre. Flaking debris consisted of 23 quartzite, two chert, two basalt, and one petrified wood flakes. Tools include two quartzite non-bipolar cores and two broken sandstone manos. One of the manos was rectangular shaped and the other had an irregular shape. No evidence of fire was noted. Soils are not well developed. The site is not a good candidate for additional research.

5LA7591

The site is an open lithic scatter consisting of flaking debris with no other features. It is situated in an open area overlooking an unnamed canyon and unnamed drainage leading to the Purgatoire River. The flakes were made of the following materials: quartzite (15), basalt (1), and chert (1). No tools were found. No features were evident on the surface of the site. The site is not a likely candidate for further work.

5LA7592

The site is a lithic scatter in an open area overlooking an unnamed canyon and unnamed drainage leading to the Purgatoire River. The site consists of flaking debris, including a variety of materials: quartzite (97), quartz (1), basalt (5), and chert (6). The chipped-stone tools included an irregular-shaped core of chert, an unidentifiable chert biface fragment, and a quartzite non-bipolar core that was battered on one end. Four manos were found. Three are fragments of less than half the original tool made of sandstone, and the fourth was a complete quartzite mano. All had oval shapes. No evidence of former fire features was noted. Soils are not well developed, and the site is not recommended for additional research.

5LA7593

This site is a small localized lithic scatter located on the ridge top. Artifact density is moderate, with a spacing of about 3 m between artifacts near the datum. Chipped-stone debitage indicates that lithic reduction (possibly core reduction) was an activity carried out at the site. Fifteen quartzite pieces, one chert piece and four pieces of a fine-grained claystone were the only raw materials noted at the site. No chipped-stone or ground-stone tools were noted. No fire features were evident on the surface, and no additional research is recommended.

5LA7594

This site is a small localized lithic scatter located on the ridge/mesa top only about 15 m from the mesa edge. Artifact density is low, with artifacts spaced at about 5-6 m apart around the datum. Quartzite (9) and hornfels/basalt (1) are the only raw materials represented at the site. It is possible that core reduction was responsible for the debitage, but no stone tools were found. Features were not evident. Additional research is not warranted.

5LA7595

This site is a diffuse lithic scatter located on the mesa top. The long axis of the site stretches out along the edge of the mesa. Artifact density as a whole is low, but there were some areas of moderate artifact density. The areas of higher density are located in or near small drainages that break the mesa edge. The relatively high count of cores and tested cobbles (blocks) may indicate that the site was an area from which quartzite raw material was procured or tested, or where the initial stages of core reduction took place. Raw materials represented in the flaking debris include quartzite (69), chert (9), and argillite (1). Cores, including three quartzite cores or tested cobbles and an argillite non-bipolar core, dominate the tool assemblage. Two other quartzite tools include a crude bifacially prepared core-tool and a projectile point preform. No evidence of former fires was noted. No additional research is recommended.

5LA7596

The site consists of a large area with widely scattered flakes within an area of nearly 2 acres. Several concentrations of lithics are located within this scatter. The site is situated within

and surrounding a small drainage on the east edge of the Black Hills, overlooking the Purgatoire River valley. Quartzite dominates the lithic detritus with 149 pieces compared to nine pieces of chert and one piece of basalt. A corner-notched projectile point (5LA7596.0.1, Type P26) made of quartzite was collected. Other chipped-stone tools include two quartzite cores, a large chunk of quartzite that was apparently tested, and two chert cores. The ground-stone tools inventory included four manos, two complete and two broken. One is oval shaped, while the others are more rectangular in shape. All are sandstone.

Several rock overhangs, at least two of which have evidence for habitation, are located in the drainage. Deposits are thin, however, and the rockshelters do not have good potential for excavation. The site is not significant.

5LA7597

The site consists of a sparse scatter of lithics on a ridge top overlooking an unnamed drainage that leads to the Purgatoire River. Six quartzite flakes and a core fragment were noted. The small site is contained in an area of about .077 acres, and no further work is warranted.

5LA7598

This site is a small, sparse lithic scatter located on the mesa top, with the mesa edge about 70 m to the south-southwest. Artifact density is low, with an average spacing of 6-8 m between flakes. Flaking debris is made of quartzite (14) and chert (2). There are about equal numbers of small and large flakes, perhaps indicating a mixed bag of reduction strategies. Two retouched/utilized flakes were collected. Both are quartzite. No fire features were noted. No ground-stone tools were recorded. The site has poorly developed soils, and it is not a likely candidate for additional research.

5LA7599

The site consists of a cluster of lithics within a much larger scatter of flakes. The artifacts are in a small drainage on the edge of a point. No diagnostic artifacts were located, but 5LA7600, which is located roughly 50-60 m to the west, contains structures and small projectile points. It is possible that 5LA7599 is associated with 5LA7600. Forty-eight flakes of quartzite and two of chert were recorded on site 5LA7599. A single tested chert cobble was the only recognizable chipped-stone tool. No other cultural remains were noted. This site is only important in its proximity to its neighbor.

5LA7600 - This is an eligible site; for a full description see Chapter III.

5LA7601

The site consists of a small cluster of flakes that are located near the end of a small point on the east edge of the Black Hills that overlooks the Purgatoire River valley. The flakes are largely quartzite (13), but several chert (5) flakes that appear to be from the same core were also

recorded. Site 5LA7601 is approximately 30 m south of site 5LA7600 and the two may be associated. No tools were found on 5LA7601, and its only possible significance is its proximity to the more important nearby site.

5LA7602

This site is a sparse lithic scatter located on the mesa top. The site is situated on a narrow point that trends in a southwest-northeast direction. The scatter is low density, with artifacts spaced about 7-9 m apart near the datum. Flaking debris is made of quartzite (19), chert (4), and basalt (1) flakes. Two chert non-bipolar cores and a single tested quartzite cobble were noted on the site. A small rock cairn (Feature 1) was recorded. It is located 75 m and 46° from the site datum; it is a small (1.5 m in diameter) pile of sandstone rocks and may be prehistoric in age. Yucca, cholla, prickly pear, juniper scrub, grama grasses (blue, side oats), and mountain mahogany are growing on the site. Soils are not well developed, though, and the site does not offer much potential for recovering intact cultural deposits.

5LA7603

The site covers an area 82 m north-south by 73 m east-west on a gentle slope of 1 or 2°, oriented downward northwest to southeast. There are juniper trees scattered throughout the site, with a higher density on the north side. There is a small clearing at the datum where the artifact concentration was noted, and there is another clearing southeast of the datum. Other vegetation includes prickly pear, cholla, small shrubs (salt bush family), two or three types of juniper, blue grama, hairy grama, and side oats grama. Surface flaking debris consists of quartzite (54), chert (17), basalt (3), and chalcedony (1) materials. A quartzite projectile point preform, an exhausted chert core, and an irregular-shaped quartzite biface fragment were found on the site. In addition, an extremely weathered fragment of a metate was noted. The site has a high percentage of locally available quartzite. No features were noted. It is not significant.

5LA7604 - This is an eligible site; for a full description see Chapter III.

5LA7605

Site 5LA7605 is a sparse lithic scatter that is located on the mesa top of the southernmost end of the Black Hills. The lithic assemblage is composed entirely of flakes, with 24 quartzite, one basalt, and one chert. Of these, the local quartzite is the most readily available. No tools were recovered. An equal amount of complex and simple flakes were noted, suggesting that this site functioned as a lithic reduction area. Soils are not well developed, and the site does not offer potential for further research.

State numbers 5LA7606 to 5LA7737 were not used in this project.

5LA7738

This is a small lithic scatter on the ridge top. The site is a low-density scatter with flakes and tools spaced at about 8-9 m apart. Chipped stone indicates that lithic reduction was carried out at the site. Three different material types were noted from the chipped-stone flaking debris: quartzite (2), chert (1), and argillite (1). A small corner-notched projectile point (5LA7738.0.1, Type P83) made of an unusual chert, a chert flake tool that was broken and burned, and a basalt non-bipolar core were found on the site. The variety in the flaking debris is unusual for such a small site. Soils are relatively well developed on the site, and some materials may be buried. Without any evidence for fire feature, e.g. heat-cracked stone, the site is not considered a good candidate for more research.

5LA7739

This site is a small dispersed lithic scatter located on the mesa top. It is situated about 60 m northwest from the edge of the mesa. All chipped stone is quartzite (eight flakes), and lithic reduction is the only activity that can be inferred at the site. Yucca, prickly pear, cholla, juniper/piñon scrub, and grama grasses (blue and side oats) are growing on the site, but soils supporting these plants are not well developed. No cultural materials are expected to be in buried contexts. The site is not significant.

5LA7740

This site is a small scatter consisting of a large basalt core and six small flakes. There is little deposition at the site, and no surface indications of thermal features were observed. Lithic material types include four quartzite and two basalt flakes. The site is insignificant and not likely to contain buried cultural remains.

5LA7741

This site contains two nearly contiguous rockshelters overlooking the Mary Doyle arm of Welsh Canyon. Lithic debitage is scattered over the talus slope from the shelters nearly to the bottom of the drainage. Portions of two rock walls remain -- one at the edge of each shelter. Two piles of flakes (one on the bedrock metate) show that the shelter has been collected. Deposition in shelters is shallow. The flaking debris is made of quartzite (115), chert (16), basalt (14), and argillite (3). Seven non-bipolar quartzite cores, showing varying degrees of reduction, were recorded on the site. Three large and crude quartzite and one argillite bifacial core-tools were also found, with two crude and unfinished quartzite bifaces, a quartzite retouched flake, and a chert drill fragment.

Ground-stone tools include a shallow-basin metate and a flat bedrock metate or grinding slick in the sandstone. Manos include a complete rectangular one, a complete quartzite one, and two broken sandstone fragments.

The site has been fairly heavily ransacked through the years. The absence of projectile points reflects this prior collecting activity. Soils are not well developed in the rockshelters and even though it is probable that fire features would be found, the site is not recommended for additional research.

5LA7742

The site consists of an extensive lithic scatter, at least three rock overhangs with evidence of cultural activity and a possible prehistoric stone structure (Feature 4). The site is located on top of a ridge that overlooks the spring at Mary Doyle's historic ranch site, and below the caprock at the ridge edge. Shelter 1 has a low ceiling and may not have been used for habitation, but a ground area is present on roof fall slabs. Shelter 2 has a historic wall and appears to have been used as a livestock pen. Prehistoric artifacts are scattered down the slope in front. At least 50 cm of deposition (based on flag probe) is present in this shelter, and intact prehistoric cultural deposits may be present. Shelter 3 has a low roof and a poorly defined wall in the interior. This shelter may also have intact cultural deposits. Several other rock overhangs are present to the southeast of shelters 1-3, but no surface indications of cultural activities were identified. The portion of the site on the ridge top has been extensively disturbed by military equipment.

Artifact density decreases to the north where there are only widely scattered artifacts (more than 20 m apart). The eastern edge of the site was defined by a fairly substantial drainage, but lithics are also probably present to the east. A possible structure made of sandstone slabs is located on the ridge top. One side of the feature is composed of slabs and is well defined, but the other side of the feature is poorly defined. A cluster of lithics was recorded in the vicinity of the structure, but little deposition is present within the feature. A bedrock metate was recorded on the edge of the drainage on the southwest corner of the site. This metate is above a rockshelter that lacked evidence for cultural activities, suggesting that this shelter may also have been used prehistorically. The eastern edge of 5LA7741 is located only 23 m from the western boundary of 5LA7742, and exposed bedrock also separates them. Despite the large size and extensive number of lithics at the site, no clearly diagnostic lithics were located. Several variously complete bifaces may be portions of projectile point preforms. The possible structure suggests that the site area was also used in the Late Prehistoric period. The site also has a historic component. Cultural use of the area clearly has been considerable, which is not surprising given its proximity to the large spring.

Appendix II: Ceramic Analysis

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Summary

Macroscopic and microscopic observations on vessel form, surface finish, and paste characteristics were made on archaeological pottery recovered from eight archaeological sites in the Pinon Canyon Maneuver Site (PCMS) (Table 1).

The objectives of the ceramic analysis were to:

- Classify the specimens into the five ware categories identified by Hummer (1989) for Pinon Canyon Maneuver Site pottery based on form, surface finish, and paste attributes.
- Assess the cultural affiliation and temporal placement of the specimens by comparison with pottery from dated contexts outside the PCMS and comparison with Hummer's dated types.
- Develop hypotheses about prehistoric pottery production locales within the PCMS by interpreting the mineralogical composition of the pottery with reference to local clay sources and geological formations.

The analyses were undertaken on a collection of 318 sherds that represents at least 12 vessels (Table 1). The sample comprises seven cord-marked vessels (58%), one polished vessel (8%), and three plain vessels (25%). One vessel (8%) could not be identified because the surfaces were highly eroded. The cord-marked vessels are the only specimens with diagnostic temporal attributes. Plains Woodland peoples made thin-walled jars with shallow, partly obliterated cord marks like those recovered from the PCMS archaeological sites during the Middle and Late Woodland periods (A.D. 1000 and 1400).

Method

Vessel form, surface finish attributes, and paste characteristics listed below were recorded in order to assign vessels to the five general wares (Cord-mark, Polish, Painted, Micaceous, and Unidentified) described by Hummer (1989) for Pinon Canyon Maneuver Site pottery. The Painted and Micaceous wares reported by Hummer are absent from this sample. A new category, labeled "Plain," was added to account for vessels with intact surfaces that lack distinctive finishing characteristics.

Vessel Form

Identifiable forms include conical jars (n=3 of the 12 vessels) based on rim form. Lip eversion, lip form, and rim decoration recorded using the forms illustrated in Figures 1 and 2. The rim sherds in this sample were too fragmentary to estimate vessel orifice diameter.

Surface Attributes (Interior and Exterior Surfaces)

Color: The exterior and interior surface color is indicated by Munsell soil color designations.

Surface texture:

Fine: Surface smooth from wiping a fine-grained paste with a yielding tool.

Grainy: Medium and coarse particles protrude from surface.

Polished: Lustrous surface achieved by rubbing the vessel with a hard tool while in a plastic state.

Tactually smooth: Inclusions leveled by rubbing surface while plastic or leather hard. No luster noted.

Polishing trough: Shallow elongated depressions created by rubbing a plastic surface with a hard tool.

Scraping striations: Fine linear ridges with sharp crests and edges.

Wiping striations: Fine linear ridges with blunted crests and edges.

Obliterated: Patterned decoration on surface, such as cordmarks or corrugations, partially destroyed by scraping, pressing, polishing, brushing, or paddling.

Cordmarked: Cord impressions made on surface while vessel was in a leather-hard state.

Paste characteristics

Color: Paste color (clay matrix) indicated by Munsell soil chart color designations.

Firing: Firing conditions inferred from the color of exterior and interior surfaces and the clay matrix. Refiring experiments were not conducted.

Fully oxidized: Colors clear throughout cross section of wall.

Incompletely oxidized: Colors clear on surface, gray in wall interior.

Partially oxidized: Light gray surface, dark gray sherd interior.

Unoxidized or reduced: Light gray, uniform.

Unoxidized or smudged: Dark gray, uniform.

Smudged: Black (Shepard 1956:106).

Hardness: Determined by comparing specimen hardness with Mohs ordinal hardness scale. Numbers indicate that pottery specimen is harder than 1 (talc), 2 (gypsum), 3 (calcite), 4 (fluorite), 5 (apatite), 6 (feldspar), 7 (quartz), 8 (topaz), 9 (cordonum), and 10 (diamond).

Paste texture:

Compact: Sherd chips or breaks evenly when broken with a pair of pliers.

Friable: Sherd crumbles when broken with a pair of pliers (Shepard 1956:440).

Inclusions: Organic and inorganic particles (rock and mineral) present in the clay matrix. These particles may have occurred naturally in the clay or may have been added to the clay by the potter as temper.

Type: Rock or mineral type identification made with reference to comparative collection and optical properties identifiable with transmitted light microscope (cleavage, fracture, etc.).

Angularity: Angularity determined using sedimentology reference chart published in the American Geological Society Data Sheets (1989).

Sphericity: Roundness and sphericity determined using sedimentology reference chart published in the American Geological Society Data Sheets (1989).

Size: Maximum diameter inclusion measured using geological reticule fitted with 0.1mm scale and with comparison to geological reference standards. Based on the size measurements, the inclusions were classified according to the Wentworth scale for soil sedimentology.

Clay	less than 2 microns
Silt	2-50 microns (.002-.05mm)
Very fine sand	50-100 microns (.05-.1mm)
Fine sand	100-200 microns (.1-.2mm)
Medium sand	200-500 microns (.2-.5mm)
Coarse sand	500-1000 microns (.5-1mm)
Very coarse sand	1000-2000 microns (1-2mm)
(Handbook for Soil Thin Section Description)	

Spacing: Spacing between inclusions

Closed space Inclusions touching

Single space One inclusion length between inclusions

Double space Two inclusion length between particles

Open space More than two inclusion lengths between particles
(after Whitbread 1986)

Density: Percentage of inclusions to clay matrix. Estimated from charts published in the American Geological Institute Data Sheets (1989).

Cord-marked Vessels

Forty-seven sherds from seven vessels have cord-marked exterior surfaces (Table 1). The cord-marks are narrow, shallow, and have been partly obliterated by smoothing or polishing. Rock and mineral inclusions make up between 5 and 15% of the vessel paste. Vessels from each site have distinct mineral compositions. The obliterated cord-marked surfaces correspond to descriptions for Middle and Late Plains Woodland cord-marked pottery described by Ellwood (1995) and Hummer (1989).

VESSEL 1

Description: Thin-walled (averaging 5mm thick) vessel with crisscrossed, overlapping, and partly obliterated cord-marks on exterior surfaces. Vessel paste exhibits very low frequencies (less than 10%) of quartz and feldspar inclusions.

Number of specimens: Four body sherds from the same vessel. FS#15, 16, 17, 18.
Site: 5LA7509.

Vessel Form: Not identified.

Construction

Construction and Thinning: Based on the cord-marks left on the exterior surfaces and absence of coils, the potter used slab construction and thinned and shaped the vessel with a cord-wrapped paddle when the clay was in a leather-hard state. The cord-wrapped paddle binds the clay together as the vessel is thinned and shaped (Ellwood 1995). Construction markings left from fingers or tools are not evident on the vessel interior because the interior surfaces of sherds in the sample are eroded.

Wall thickness: 5mm

Firing: Unoxidized.

Surfaces

Exterior: The exterior surface colors range from gray to pinkish gray (7.5YR4/1, 7.5YR6/2, 7.5YR7/2). The color variation may reflect uneven firing conditions. The potter left overlapping cord-marks, criss-crossed at oblique angles, on the vessel exterior. Single-ply cord impressions, 0.3-0.4mm wide, 0.5mm deep, and spaced 0.2-0.3mm apart, have been partly obliterated by polishing. Flattened polished ridges between the cord impressions have a slight luster. The exterior surface topography is even.

Interior: The interior surfaces remain intact on field specimen #16 only, which is pinkish gray (7.5YR7/2). The surface is tactually smooth and lacks wiping marks and striations.

Paste

Color: Very dark gray (7.5YR3/1). Incompletely oxidized.

Texture: Friable. Mohs hardness 2.5.

Inclusions: Density less than 10%.

Medium fraction (0.2-0.5mm): Sub-rounded feldspar (rare, open space).

Fine fraction (0.1-0.2mm): None

Very fine fraction (0.05-0.1mm): Sub-angular quartz (rare, open space).

Comments

The low inclusion density and friable paste suggests that this vessel was made expediently with little attention to enhancing strength or thermal performance. The low inclusion frequency suggests that the quartz and feldspar occurred naturally in the clay and were not added as temper.

VESSEL 2

Description: Thin-walled (averaging 5.3 mm thick) vessel with parallel and partly obliterated cord-marks on exterior surfaces. Vessel paste exhibits very low frequencies (less than 10%) very fine fraction biotite and volcanic ash inclusions.

Number of specimens: 18 body sherds from same vessel. (Catalogue number 5LA7438.0.11, FS#12).

Site: 5LA7438

Vessel Form: Not determined.

Construction

Construction and thinning: Based on the cord-marks left on the exterior surfaces, the potter thinned and shaped a slab-constructed vessel with a cord-wrapped paddle when the clay was in a leather-hard state. Construction marks from fingers or shaping tools are not evident on the vessel interior.

Wall Thickness: 4.5-7.0mm, mean = 5.3mm.

Firing: Incompletely oxidized.

Surfaces

Exterior: The vessel exterior is light brownish gray (10YR6/2). The potter left overlapping parallel cord-marks on the exterior surfaces (no criss-cross). The single-ply 1-1.2mm, 0.5mm deep, cord impressions are spaced 0.7-1mm apart. The potter almost obliterated the cord-impressions by smoothing with a yielding tool. The exterior surfaces were not polished, and the flattened ridges between the cord impressions lack luster. Fine fraction (0.1-0.2mm) inclusions are visible on the exterior surface. The surface topography is even.

Interior: The interior is gray (10YR5/1), and the surface is tactually smooth. No wiping marks or striations are evident at 30X magnification. The surface topography is even.

Paste

Color: Dark gray (10YR4/1). Incompletely oxidized.

Texture: Friable. Mohs hardness 2.

Inclusions: Density is less than 10%.

Medium fraction (0.2-0.5mm): None

Fine fraction (0.1-0.2mm): None

Very fine fraction (0.05-0.1mm): Sub-angular biotite (rare, open-space) and sub-rounded volcanic ash (rare, open space).

Comments

The low inclusion density suggests that the vessel was manufactured expediently with little attempt to enhance mechanical properties.

VESSEL 3.

Description: Thin-walled (5mm) jar with cord-marked and polished exterior. The paste exhibits 25-30% medium and fine fraction angular quartz and mica inclusions.

Number of specimens: 6 body sherds from same vessel. (Catalogue numbers 5LA7600.0.17, 5LA7600.0.19, FS#18 and 19)

Site: 5LA7600

Vessel Form: Not determined.

Construction

Construction and thinning: Potter thinned and shaped a slab-constructed vessel with a cord-wrapped paddle. Construction marks are not visible on the vessel interior because the surfaces are eroded.

Wall thickness: 4.2-6.3mm, mean = 4.9mm

Firing: Incompletely oxidized.

Surfaces

Exterior: The exterior color is very pale brown (10YR7/2, 10YR8/2, 10YR8/3). The potter left overlapping cord-marks on the vessel exterior that run in parallel. Surfaces covered with two-ply cord impressions, 1-1.5mm wide, 0.5mm deep, and spaced 1-1.5mm apart, have been polished. The ridges between the cord impressions are flattened and lustrous. Inclusions are not visible on any exterior sherd surfaces. The surface topography is even.

Interior: The interior surface color is very pale brown (10YR8/2, 10YR7/4). The interior surfaces are eroded, and 0.5mm-diameter quartz and quartzite inclusions are visible on the surface. The surface topography is even.

Paste

Color: Dark gray (10YR4/1) firing streak. Incompletely oxidized.

Texture: Compact. Mohs hardness 2.

Inclusions: Total inclusion density equals 20-25%.

Medium fraction (0.2-0.5mm): Sub-angular biotite (common, double space), sub-angular quartz (common, double space), sub-angular quartzite (common, double space), and sub-angular to sub-rounded feldspar (rare, open space).

Fine fraction (0.1-0.2mm): Sub-angular biotite (common, double space), sub-angular quartz (common, double space), sub-angular to sub-rounded feldspar (rare, open space).

Very fine fraction (0.05-0.1mm): Sub-angular quartz (common, double space).

Comments

The high inclusion frequency distinguishes this (5LA7600) vessel from the cord-marked vessels from 5LA7438 and 5LA7509.

VESSEL 4

Description: Conchoidal jar with partly obliterated cord-marks on exterior surfaces. Paste exhibits a low density (less than 10%) of volcanic ash, quartz, and hematite inclusions.

Number of specimens: three body sherds and one rim sherd from the same vessel.

Catalogue number 5LA6878.0.13, FS # 26 (two body sherds).

Catalogue numbers 5LA6878.0.21 and 5LA6878.0.22, FS # 35 (one body and one rim sherd).

Site: 5LA6878

Vessel Form: Jar, possibly conchoidal with a square lip. Two millimeter wide and 1 mm deep cord impressions placed at a 30 degree angle to the orifice appear on the lip.

Construction

Construction and thinning: Slab construction with cord-wrapped paddle used to shape and thin the vessel walls. Construction marks from fingers or tools are not visible on interior surfaces.

Wall thickness: 5.2 mm

Firing: Incompletely oxidized.

Surfaces

Exterior: The exterior is light brown (7.5YR6/3). The potter left intact cord impressions on the jar exterior perpendicular to the rim. One-mm-wide two-ply cord impressions placed 1mm apart are clearly visible on the rim sherd. Cord impressions on the body sherds have been partially obliterated by polishing. Flattened ridges between the cord impressions have a slight luster.

Interior: The jar interior is light brown (7.5YR6/3), tactually smooth, and lacks wiping marks or striations. Interior surfaces are not polished, and the surface topography is even.

Paste

Color: Dark gray (7.5YR4/1). Incompletely oxidized.

Texture: Compact. Mohs hardness 4.

Inclusions: Density less than 10 percent.

Medium fraction (0.2-0.5mm): Sub-rounded volcanic ash (common, double to open space), sub-angular feldspar (rare, open space), and sub-angular hematite (rare, open space).

Fine fraction (0.1-0.2mm): Sub-angular quartz (rare, open space).

Very fine fraction (0.05-0.1mm): Sub-rounded quartz (rare, open space).

Comments

The medium fraction ash and feldspar and very fine fraction quartz sand create a bimodal size distribution. Perhaps the ash and feldspar were added as temper. Iron oxide minerals (perhaps hematite) occur only in vessels from 5LA6878. This may indicate use of local clays with naturally occurring iron oxide inclusions.

VESSEL 5.

Description: Vessel with obliterated cord marks with large (up to 0.5mm diameter) volcanic ash.

Number of specimens: 6 body sherds and one rim sherd from the same vessel.

Catalogue numbers 5LA6878.0.25, FS #38 1 sherd

5LA6878.0.21, FS#27 2 sherds

5LA6878.0.16, FS#30 1 sherd

5LA6878.0.26, FS #39 1 sherd

5LA6878.0.20, FS#34 1 sherd

5LA6878.0.19, FS#33 1 sherd

Site: 5LA6878.

Vessel Form: Not determined.

Construction

Construction and Thinning: Slab construction with cord-wrapped paddle used to shape and thin the vessel walls. Construction marks from fingers or tools are not visible on interior surfaces.

Wall thickness: 4.4-5.5mm, average 4.7mm

Firing: Incompletely oxidized, possibly smudged.

Surfaces

Exterior: Color light brown (7.5YR6/4) to light yellowish brown (10YR6/4). The potter left intact single-ply, 1-2 mm-wide, 0.5mm-deep, cord impressions placed 1mm apart running parallel to each other. The cord impressions have been partially to almost completely obliterated by polishing over the cord-marked areas. The ridges between cord impressions are flattened and polished to a lustrous state. The surface topography is even.

Interior: Color gray (7.5YR5/1, 10YR6/1), possibly smudged. Surface is tactually smooth, with no wiping marks or striations. Fine fraction particles are visible on the surface. Even surface topography.

Paste

Color: Very dark gray (7.5YR3/1). Incompletely oxidized. Possibly smudged.

Texture: Friable, Mohs hardness 2.

Inclusions: Density 10-15 percent, poorly sorted.

Medium fraction (0.2-0.5mm): Sub-angular to angular volcanic ash (common, double to open space), sub-angular quartz (common, open space), and a sub-rounded biotite (rare, open space). Occasional coarse fraction (0.5-1mm) volcanic ash.

Fine fraction (0.1-0.2mm): Sub-angular volcanic ash (double-open space), sub-angular quartz (rare, open space).

Very fine fraction (0.05-0.1mm): Sub-angular quartz (common, double space).

VESSEL 6

Description: Red vessel with well oxidized exterior, obliterated cord marks, and large (up to 0.5mm diameter) volcanic ash inclusions.

Number of specimens: 8 body sherds from the same vessel.

Catalogue numbers 5LA6878.0.30, FS #30 4 sherds

5LA6878.0.23, FS#36 1 sherd

Site: 5LA6878.

Vessel Form: Not determined.

Construction

Construction and Thinning: Slab construction with cord-wrapped paddle used to shape and thin the vessel walls. Construction marks from fingers or tools are not visible on interior surfaces.

Wall thickness: 4.7-4.8 mm

Firing: Incompletely oxidized.

Surfaces

Exterior: Color light red (2.5YR6/6). The potter left intact, single-ply, 1-2 mm-wide, 0.5mm-deep, cord impressions placed 1mm apart running parallel to each other. The cord impressions have been partially obliterated by smoothing over the cord-marked areas. The ridges between cord impressions are flattened. The surface topography is even.

Interior: The interior color is reddish gray (2.5YR5/1, 10YR6/1). The surface has been polished smooth and has a slight luster. Inclusions are not visible on the surface. The surface topography is even.

Paste

Color: Dark red gray (2.5YR4/1). Incompletely oxidized.

Texture: Very friable. Mohs hardness 2.

Inclusions: Inclusion density is 15 to 20 percent.

Coarse fraction (0.5-1mm): Sub-rounded and rounded volcanic ash (common, double to open space).

Medium fraction (0.2-0.5mm): Sub-angular to angular volcanic ash (common, double to open space), sub-angular quartz (common, open space), and a sub-rounded black metallic mineral (rare, open space).

Fine fraction (0.1-0.2mm): Sub-angular volcanic ash (double-open space), sub-angular quartz (rare, open space), sub-rounded hematite (infrequent, double to open space).

VESSEL 7

Description: Thin-walled (averaging 5.2 mm) jar with obliterated cord-marks on exterior surfaces. Vessel paste exhibits very low frequencies (less than 5 percent) quartz and feldspar inclusions.

Number of specimens: 1 rim sherd and 1 body sherd from the same vessel.

Catalogue numbers: 96.139.0.12, FS#25 1 rim sherd

96.139.0.34, FS#34 1 body sherd

Site: 5LA6878

Vessel Form: Conical jar with interior beveled rim. Single-ply, 2-mm-wide cord impressions appear on the rim. The rim sherd is too fragmentary to estimate the vessel orifice diameter.

Construction

Construction and Thinning: Based on the cord-marks left on the exterior surfaces and absence of coils, the potter used slab construction and thinned and shaped the vessel with a cord-wrapped paddle when the clay was in a leather-hard state.

Wall thickness: 5.2 mm

Firing: Incompletely oxidized.

Surfaces

Exterior: The exterior surface color is very pale brown (10YR7/3). The potter left 1- to 1.5-mm-wide, 0.3-mm-deep cord-marks on the vessel exterior that have been almost completely obliterated by polishing. Ridges between the cord impressions have been polished to a lustrous state. No inclusions are evident on the surface. The exterior surface topography is even.

Interior: The interior is pink (7.5YR6/3) and polished.

Paste

Color: Very pale brown (10YR7/3). Incompletely oxidized.

Texture: Compact. Mohs hardness 3.

Inclusions: Density less than 10%

Medium fraction (0.2-0.5mm): None

Fine fraction (0.1-0.2mm): None

Very fine fraction (0.05-0.1mm): Sub-angular quartz (rare, open space).

Cord-marked Wares: Temporal Placement and Cultural Affiliation

The cord-marked wares belong to the Plains Woodland ceramic tradition. Middle and Late Woodland cord-marked ceramics (A.D. 1050-1400) exhibit slab building, conical forms, thin walls, and narrow, partly obliterated cord impressions (Ellwood 1995). Thick-walled, coarse-textured, and deeply cord-marked vessels made during the transitional Plains Woodland and earlier periods (A.D. 150-1000) are absent from this sample. Proto-historic and historic Apache groups in eastern Colorado did not make cord-marked pottery (Brunswick 1995).

Hummer (1989) identified four cord-marked pottery categories for PCMS pottery that are distinguished by inclusion type, density, wall thickness, and decoration. The thin-walled, obliterated cord-marked, and sparsely tempered sherds in this sample most closely match Hummer's cord-mark category 4 (n=91 body and 3 rim sherds). Hummer's category 4 comprises "obliterated cord-marked, thin walled, medium textured vessels with a diagonally notched rim and 5-40% (average 15-25%) quartz, ash and mica inclusions" (Hummer 1989:329). Hummer reports that samples in cord-mark category 4 are similar to Middle Woodland Upper Republican (Plains Village period, A.D. 1050-1450) or Middle Woodland Apishapa phase pottery (A.D. 1000-1300). A single cord-marked category 4 vessel from site 5LA5554 in the Pinon Canyon Maneuver site date

postdates A.D. 1380 (Hummer 1989:333). Hummer's remaining cord-mark categories, 1 (n=1), 2 (n=1), and 3 (n=4), which exhibit thicker walls (averaging 1 cm) and higher (~30-40%) rock and mineral inclusion frequencies, have fewer similarities with the sherds in this sample.

Pottery in this sample has fewer inclusions (averaging 5-10%) than the cord-marked wares from other contexts, including Hummer's cord-mark category 4 vessels. The lower inclusion density and differences in mineral composition have little relevance for understanding cultural affiliation and temporal placement of the cord-marked pottery, however, if Black Hills potters used local clays without modification. It is probably unwise to use rock and mineral inclusions as criteria for classifying types (with the exception of micaceous wares) without information on the mineralogical composition of clay sources in the Black Hills and Bent Arroyo. The small sample size examined here also prohibits systematic comparisons among paste attributes (inclusion types, size, sorting), wares, and sites to define local technological traditions.

Polished Vessels

One vessel, represented by 16 body sherds, was polished. Polished vessels, compared to smoothed or plain vessels, have a lustrous exterior surface that results from rubbing leather-hard clay with a hard tool or polishing stone.

VESSEL 1

Description: Unidentified form with polished exterior and very low density (less than 10%) of sandstone and quartz inclusions.

Number of specimens: 16 body sherds from the same vessel (Catalogue No. 5LA7410.0.14)

Site: 5LA7341

Vessel Form: Undetermined

Construction

Construction and thinning: No evidence for construction evident

Wall thickness: Ranges from 4.0-6.0 mm for body, average wall thickness 4.25 mm.

Firing: Incompletely oxidized.

Surfaces

Exterior: Color varies from grayish brown (10YR5/2) to brown (10YR5/3) to light brownish gray (10YR6/3) to pale brown (10YR6/3). Variation in color may reflect uneven firing conditions. Exterior surfaces have a tactually smooth texture. Polishing troughs are clearly visible with the unaided eye. The troughs are 0.5 to 1.5 mm wide and approximately 0.25mm deep. The surface topography is even.

Interior: Color ranges from dark gray (10YR4/1) to gray (10YR6/1) to brown (10YR5/1, 10YR5/3) to gray (10YR6/2). The interior surfaces are smoothed with irregular surface topography. No polishing marks are evident.

Paste

Color: Very dark grayish brown (10YR3/2). Firing core. Incompletely oxidized.

Texture: Compact. Mohs hardness 3.5.

Inclusions: Inclusion density of approximately 10 percent.

Medium fraction (0.2-0.5mm): None

Fine fraction (0.1-0.2mm): Sub-angular quartz (uncommon, open space), sub-angular sandstone (rare, open space).

Very fine fraction (0.05-0.1mm): Sub-angular quartz (uncommon, open space).

Comments

The inclusions are poorly sorted and irregularly spaced despite the low density. Temporal placement and cultural affiliation for the polished vessel were not determined. The rim and other segments of the vessel with potentially diagnostic attributes were missing.

Plain Vessels

The three plain vessels in the sample have intact surfaces and lack other diagnostic decorative or formal characteristics. 209 (66.4%) sherds from a single vessel were excavated from site 5LA7410. Remains of the other two plain vessels are from site 5LA 7538 and site 5LA6878.

VESSEL 1

Description: Conchoidal jar From site 5LA7410 with a high density (35%) of quartz and biotite inclusions.

Number of specimens: 208 body sherds and 1 rim sherd from the same vessel.

2 sherds from surface (Catalogue No. 5LA7410.0.3)

31 sherds from excavation level I (Catalogue No. 5LA7410.0.4)

14 sherds from excavation level I, ceramic concentration in situ (Catalogue No. 5LA7410.0.5)

31 sherds from feature 1 (Catalogue No. 5LA7410.0.1, FS#2)

1 rim sherd (Catalogue No. 5LA7410.0.2, FS#2)

130 body sherds collected from waterscreening.

Site: 5LA7410

Vessel Form: Conchoidal jar with tapered rim. Rim sherd (Catalogue No. 5LA7410.0.2) too small to reliably estimate orifice diameter.

Construction

Construction and thinning: Slab construction with fingers apparently used for forming and shaping since the surface topography is irregular and there is no evidence for striations or marks made from finishing tools. Surfaces are eroded on many sherds, unable to make interpretations.

Wall thickness: Ranges from 5.0-5.7 mm for body, average wall thickness 5.4mm.

Firing: Incompletely oxidized.

Surfaces

Exterior: Color brown (7.5YR4/2, 7.5YR5/2, 7.5YR5/3). Variation in color may reflect uneven firing conditions, or discoloration from placement over a fire. Exterior surfaces have a tactilely smooth texture. The surface topography is uneven with irregular indentations. It appears that fingers, rather than finishing tools, were used to smooth and shape the vessel.

Interior: Color ranges from black to dark gray to brown (7.5YR2.5/1, 7.5YR4/1, 7.5YR5/3). Variation in color may reflect uneven firing conditions, or discoloration from placement over a fire. Interior surfaces are highly eroded.

Paste

Color: Very dark gray (10YR3/1). Incompletely oxidized.

Texture: Friable. Mohs hardness 2.5.

Inclusions: Inclusion density is 30-35%.

Medium fraction (0.2-0.5mm): sub-angular quartz (common, single space), sub-angular feldspar with cleavage planes (common, single to double space), and sub-angular quartzite (rare, open space).

Fine fraction (0.1-0.2mm): sub-angular quartz (common, single space), sub-angular feldspar (common, single to double space, and sub-angular quartzite (rare, open space).

Very fine fraction (0.05-0.1mm): angular biotite (common, single space).

Comments

The extremely friable paste and irregular surfaces suggest that this vessel was made expediently without attention to enhancing mechanical, thermal, or stylistic properties.

VESSEL 2

Description: Conchoidal jar with wiping striations and troughs clearly visible on exterior and with low density (10-15%) of quartz, feldspar and biotite inclusions.

Number of specimens: 30 body sherds and 1 rim sherd from the same vessel (Catalogue No. 5LA7538.0.1, FS#1).

Site: 5LA7538

Vessel Form: Conchoidal jar with rounded lip. Rim sherd too small to reliably estimate orifice diameter.

Construction

Construction and thinning: Not determined

Wall thickness: Ranges from 4.3-5.0 mm for body, average wall thickness 4.7mm.

Firing: Incompletely oxidized.

Surfaces

Exterior: The jar exterior is brown (7.5YR5/2 to 7.5R5/4). Wiping striations are visible on 25 of the 30 sherds. Of these, 7 have broad deep striations (0.8mm wide and 1 mm deep) running parallel to the vessel rim. Eleven have broad shallow striations 0.2-0.5mm wide spaced 0.5 mm apart. Five sherds have scraping striations with sharp angular ridges
Interior: The interior color ranges from very dark gray to brown (7.5YR3/1, 7.5YR4/2, 7.5YR4/3). The variation in color may reflect uneven firing conditions. Interior surfaces on intact sherds are tactually smooth, lack other finishing marks, and have an even surface topography.

Paste

Color: Black (7.5YR2.5/1). Incompletely oxidized. There is a 0.5mm-wide oxidized rind adjacent to interior and exterior surfaces.

Texture: Friable. Mohs hardness 2.5.

Inclusions: Inclusion density is 10-15%.

Medium fraction (0.2-0.5mm): Sub-angular quartz (rare, open space), sub-angular feldspar (rare, open space).

Fine fraction (0.1-0.2mm): Sub-angular quartz (predominant/common, single space to double space) sub-angular feldspar (single to double space).

Very fine fraction (0.05-0.1mm): angular biotite (common, double space).

Comments

Paste poorly sorted. Main distinguishing characteristic is the surface striations.

VESSEL 3

Description: Vessel form with thick (5.8mm) walls and low (less than 10 percent) density ash and metallic iron mineral temper.

Number of specimens: 6 body sherds from the same vessel.

Catalogue No. 96.139.0.15, FS#28 1 sherd

Catalogue No. 96.139.0.17, FS#31 1 sherd

Catalogue No. 96.139.0.24, FS#37 3 sherds

Catalogue No. 96.139.0.27, FS#40 1 rim sherd

Catalogue No. 96.139.0.29, FS#41 1 sherd

Site: 5LA6878

Vessel Form: Jar, possibly conical, with interior beveled and undecorated rim.

Construction

Construction and thinning: Not determined.

Wall thickness: 5.8mm.
Firing: Incompletely oxidized.

Surfaces

Exterior: Color pale brown (10YR6/3). Tactually smooth surface texture with uneven surface topography. No finishing marks evident.

Interior: Color gray (10YR5/1). Grainy surface texture. Coarse fraction particles protrude from smoothed surface. Irregular surface topography.

Paste

Color: Very dark gray (10YR3/1). Incompletely oxidized or smudged.

Texture: Extremely friable. Mohs hardness 2.

Inclusions: Inclusion density is less than 10%.

Coarse fraction (0.5-1.0mm): Sub-rounded volcanic ash (rare, open space).

Medium fraction (0.2-0.5mm): Sub-rounded hematite (rare, open space).

Fine fraction (0.1-0.2mm): Sub-rounded hematite (rare, open space), angular volcanic ash (rare, open space).

Very fine fraction (0.05-0.1mm): Angular volcanic ash (rare, open space).

Unidentifiable Specimens

This category includes one vessel with highly eroded surfaces that could not be otherwise classified.

VESSEL 1

Description: Vessel with medium fraction angular quartz inclusions. Total inclusion density~25 percent.

Number specimens: 6 body sherds from the same vessel (Catalogue No. 5LA7424.0.4, FS#4).

Site: 5LA7424

Vessel Form: Not identified

Construction

Construction and thinning: Not determined.

Wall thickness: 4.5-5.0mm

Firing: Incompletely oxidized.

Surfaces

Exterior: Color gray (10YR6/1). Grainy texture due to weathering/erosion. Medium fraction inclusions visible on exterior surface unaided. Surface topography even.

Interior: Color pale brown (10YR6/3). Grainy texture due to weathering/erosion. Medium fraction particles visible on interior surface. Even surface topography.

Paste

Color: Gray (10YR5/1). Incompletely oxidized.

Texture: Compact. Mohs hardness 2.5.

Inclusions: Inclusion density is 25%.

Medium fraction (0.2-0.5mm): Sub-angular feldspar (common, single to double space), angular quartz (common, double to open space).

Fine fraction (0.1-0.2mm): Sub-angular feldspar (common, single to double space), sub-angular volcanic rock (common, double space), sub-angular quartzite (common, open space).

Very fine fraction (0.05-0.1mm): sub-angular quartz (common, open space).

Discussion and Suggestions for Future Work

The people that lived in the project area during the prehistoric period were highly mobile yet they used pottery vessels. What technical and behavioral strategies make pottery manufacture and use feasible among residentially mobile groups? Compared with hide containers and baskets, pottery is heavy, breakable, and awkward to transport. Ethnographers have observed that pottery-using, residentially mobile groups employ at least two strategies solve these problems. Pottery containers are often stored at residential sites rather than transported during a residential move. Vessels are also made expediently when needed. For example, Ewers (1945) reported that the Blackfoot manufactured cooking pots as needed at their hunting camps. He describes an incident where the butchered leg bones from a slaughtered antelope were cooked in a bowl that had been made on the spot from some locally acquired clay. The pot was baked (fired) in the same cooking fire in which the antelope bone was eventually cooked. The low mineral inclusion densities in PCMS pottery and the friable paste textures suggest that clays were used with little modification and fired at low temperatures for short periods, characteristics consistent with expedient manufacture. Compositional data on clay deposits within the PCMS are needed to assess this proposition.

Petrographic analyses of Black Hills clay deposits would be very useful to identify mineralogical variability (type, size, and sorting of inclusions) in local clay deposits. The composition of the clays can then be compared with the mineralogical compositions of the pottery to determine whether potters modified clays by adding rock and mineral temper. A meter-thick clay deposit underlies the Ross soil in the PCMS Hillman locality reported by McFaul and Reider (1990). The Hillman locality is situated on the southern edge of the Coder Terrace at the northern end of the Black Hills. Silty clay deposits are also exposed at the southern end of Bent Arroyo at its confluence with the Purgatoire River. Prehistoric potters in the Black Hills may have used either clay source.

Interpreting the mineral composition in PCMS cord-marked, polished, and plain pottery with reference to local clay deposits will also help to identify technological traditions in the region which may have temporal or cultural significance. Information on the clays that pots were made from, the addition of tempering materials, paste preparation practices, and firing regimes can be obtained from sherds that lack distinct decorative, surface finish, or formal characteristics. Chemical characterization of PCMS pottery and clays would also be useful to define clay catchment areas utilized by prehistoric potters in the region, and to identify variability in local manufacturing traditions.

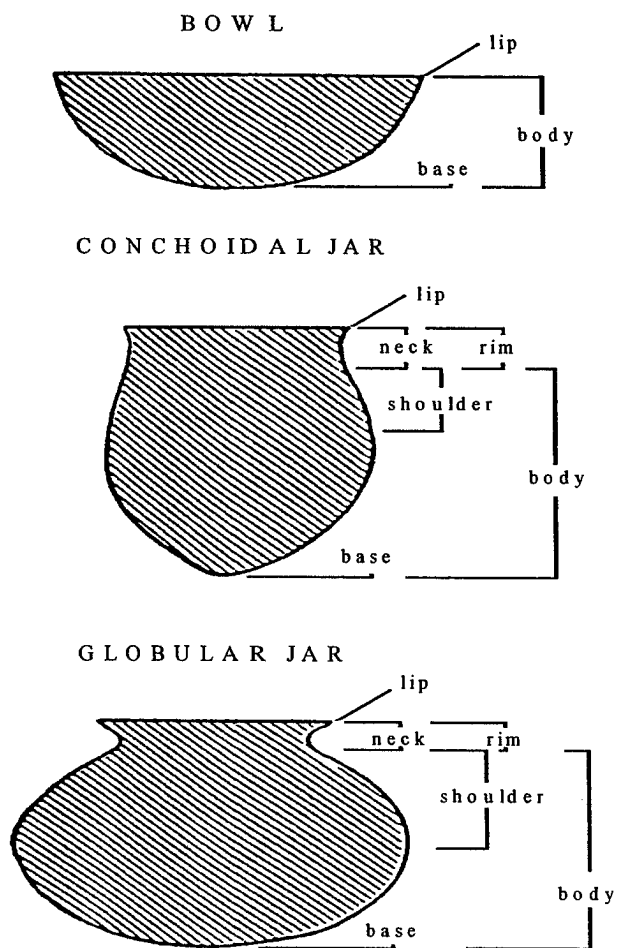
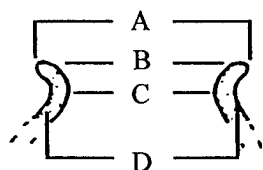


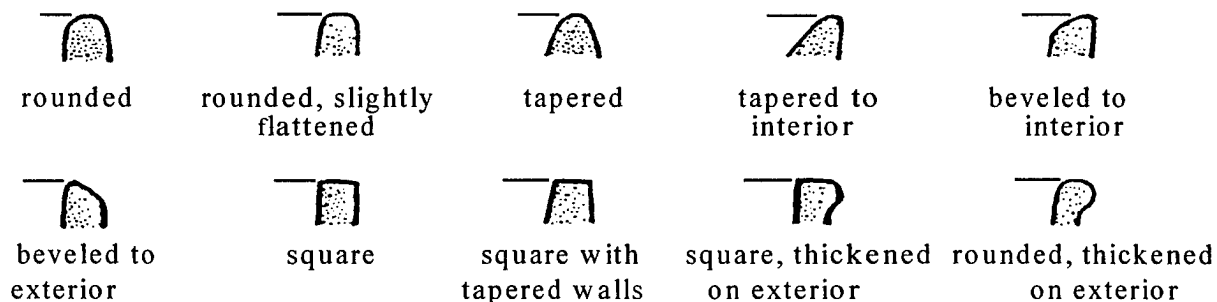
Figure 1: Vessel Morphology (Photocopied from Hummer 1989).

CERAMIC ORIFICE DIAMETER MEASUREMENTS



- A. maximum exterior orifice diameter
- B. maximum interior orifice diameter
- C. minimum interior orifice diameter
- D. minimum exterior orifice diameter

LIP FORM



LIP DECORATION

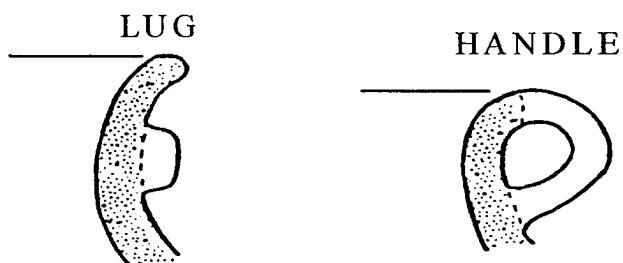
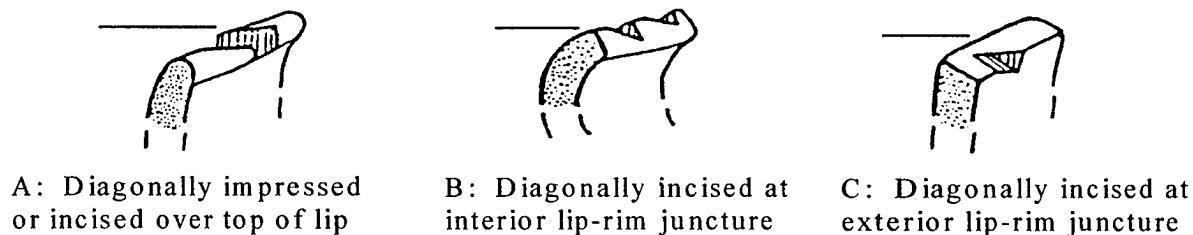


Figure 2: Rim Attributes (Photocopied from Hummer 1989).

Table 1. PCMS Ceramic Frequencies

Site ID	FS#	n sherds	%	n vessels	%
<u>Cordmark</u>					
5LA7438		18	5.7%	1	8.3%
5LA7600	18,19	6	1.9%	1	8.3%
5LA7509	15,16,17,18	4	1.3%	1	8.3%
5LA6878	25, 34	2	0.6%	1	8.3%
5LA6878	26, 35	4	1.3%	1	8.3%
5LA6878	27,30,33,34, 38,39,43,	8	2.5%	1	8.3%
5LA6878	36, 42	5	1.6%	1	8.3%
Total Cordmark		47	14.8%	7	58.3%
<u>Plain</u>					
5LA7410	2	79	24.8%	1	8.3%
	1-1, screen	132	41.5%		
5LA7538	1	31	9.7%	1	8.3%
5LA6878	28, 31, 37, 40, 41	7	2.2%	1	8.3%
Total Plain		249	78.3%	3	25.0%
<u>Polish</u>					
5LA7341	14	16	5.0%	1	8.3%
<u>Unidentified</u>					
5LA7424	4	6	1.9%	1	8.3%
TOTAL		318	100.0%	12	100.0%

References Cited

American Geological Society

1989 American Geological Society Data Sheets, compiled by J. Thomas Dutro, Richard V. Deitrich, and Richard M. Fouse. American Geological Institute.

Brunswig, Robert H.

1995 Apachean Ceramics East of Colorado's Continental Divide: Current Data and New Directions. In *Archaeological Pottery of Colorado: Ceramic Clues to the Prehistoric and Protohistoric Lives of the State's Native Peoples*, edited by Robert H. Brunswig, Bruce Bradley, and Susan M. Chandler, pp. 172-191. Colorado Council of Professional Archaeologists Occasional Papers Number 2. Denver, Colorado.

Ellwood, Pricilla B.

1995 Pottery of Eastern Colorado's Early and Middle Ceramic Periods. In *Archaeological Pottery of Colorado: Ceramic Clues to the Prehistoric and Protohistoric Lives of the State's Native Peoples*, edited by Robert H. Brunswig, Bruce Bradley, and Susan M. Chandler, pp. 129-161. Colorado Council of Professional Archaeologists Occasional Papers Number 2. Denver, Colorado.

Ewers, John Canfield

1945 *Blackfeet Crafts*. U.S. Indian Service Educational Division, Lawrence, Kansas.

Hummer, Anne G.

1989. Prehistoric Ceramics. In *Temporal Assessment of Diagnostic Materials from the Pinon Canyon Maneuver Site: Towards the Development of a Cultural Chronology for Southeastern Colorado*, edited by Christopher Lintz and Jane L. Anderson, pp. 316-374. Memoirs of the Colorado Archaeological Society Number 4, Colorado Archaeological Society.

McFaul, Michael, and Richard G. Reider

1990 Geoarchaeological Setting. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado*, Vol. 1, edited by William Andrefsky, pp. II-1 to II-50. Manuscript on file with the National Parks Service and the United States Department of the Army.

Shepard, Anna O.

1956 Ceramics for the Archaeologist. Publication 609. Carnegie Institution of Washington, Washington, D.C.

Whitbread, Ian

1986 A proposal for the systematic description of thin sections toward the study of ancient ceramic technology. In *Archaeometry: Proceedings of the 25th Annual Symposium*, edited by Y. Maniatis, pp. 127-138. Elsevier, Amsterdam.

Appendix III: UWXRF Letter Report 98.3

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UWXRF Letter Report 98.3

May 27, 1998

Vincent Schiavitti
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Department of Sociology and Anthropology
Las Cruces, NM 88003

Dear Vince,

This letter details the results of the X-ray fluorescence (XRF) analysis of the obsidian artifacts from your Colorado site.

The chemical data of the obsidian samples was performed on a commercially available Phillips Co. wave-length dispersive XRF spectrometer. The apparatus for this laboratory analysis is operated by Chris McKee at New Mexico School of Mines in Socorro, New Mexico. Phillips provided pure glass with trace elements and their X40 Software for microprocessor control, calibration, stabilization, and data analysis. All lines are used to correct for drift and the comparison of K-alpha to K-alpha Compton is used to determine a mass absorption correction. The data as provided by the computer control includes the element concentrations converted to parts per million (ppm).

The output includes 16 elements and the 5 chosen as adequately diagnostic are rubidium (Rb), strontium (Sr), yttrium (Y), zirconium (Zr), and niobium (Nb).

While the normal procedure is for the lab to grind and press the material into a tablet for analysis, I visited the lab to determine if a non-destructive analysis could be performed. I submitted a sample of known source material from Obsidian Cliff in Yellowstone National Park to be ground and analyzed in the normal manner used by the lab for geological samples. The element concentrations were in agreement with measurements from my apparatus at the University of Wyoming, with flakes from the same nodule, and with values in the literature. A comparison is given in Table 1.

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 Table 1. Comparison of element concentrations from selected
 Obsidian Cliff, Yellowstone National Park source material, using
 different laboratory preparation methods. The XRF wave-length
 dispersion method or XRF energy dispersion method is listed.

	Chemical composition in ppm						XRF method	Specimen form
	Rb	Sr	Y	Zr	Nb	Fe		
1	241	nd	86	193	50	9024	wave-length	pellet
2	241	2	83	172	49	nd	wave-length	pellet
3	224	2	77	159	41	nd	wave-length	flake
4	239	3	79	160	40	nd	wave-length	flakes
5	251	9	66	189	33	9442	wave-length	pellet
6	257	1	80	226	65	8572	energy	flakes
7	243	5	88	211	46	9512	wave-length	pellet

-
¹ Ground, powder pellet, ID 129.2, wave-length dispersion.
² Ground, powder pellet, ID 130A.15, wave-length dispersion.
³ Flake, ID 130A.11, wave-length dispersion.
⁴ Four flakes, ID 130A.1,3,4,5, wave-length dispersion.
⁵ Four pressed powder pellets, Nelson 1984, wave-length
 dispersion.
⁶ Nine flakes, ID 950201, energy dispersion at the University of
 Wyoming.
⁷ Eight pressed powder pellets, Anderson 1986, wave-length
 dispersion.

Matches between unknown artifacts and known obsidian source
 chemical groups are made on the basis of correspondence between
 the element concentrations. The known matching source groups
 were found in my collection and the unknowns were not reliably
 found in a search of published data at the present time (Nelson
 1984, Anderson 1986).

The artifact matches to a geochemical source type are given in
 the data table (Table 2).

Yours truly,

Ray K
 Raymond Kunselman
 Department of Physics
 University of Wyoming
 Laramie, WY 82071-3905

Table 2. Element concentrations in ppm. The errors for single counts are about 4 ppm for Rb and Sr, 5 for Y and Zr, and 7 for Nb. [02 March 1998 5LA Archaeological Project (Colorado)]

Catalog number	Rb	Sr	Y	Zr	Nb	Fe	Fe%	Chemical source
Cerro del Medio, middle Jemez Mountains, NM								
30 5LA7416.0.1	154	4	43	166	50	7833	1.12	JM
3 5LA7270.0.1	165	5	48	176	51	9652	1.38	JM
9 5LA7281.0.8	165	5	43	172	51	8183	1.17	JM
13 5LA7341.0.3	144	4	44	158	46	9092	1.3	JM
34 5LA7519.0.1	156	4	49	168	51	8673	1.24	JM
22 5LA7357.0.1	158	4	44	162	48	8812	1.26	JM
31 5LA7416.0.7	161	4	46	168	51	8603	1.23	JM
4 5LA7270.0.12	128	4	39	134	36	11190	1.6	JM
18 5LA7342.0.37	158	4	47	168	47	11540	1.65	JM
24 5LA7357.0.11	151	5	43	150	42	11260	1.61	JM
Polvadera Peak, north Jemez Mountains, NM								
10 5LA7282.0.7	149	5	23	64	38	5945	0.85	JN
21 5LA7351.0.14	150	4	24	67	41	5315	0.76	JN
14 5LA7342.0.12	152	5	26	71	43	4686	0.67	JN
7 5LA7277.0.5	149	5	25	69	42	5036	0.72	JN
29 5LA7400.0.33	145	4	19	60	36	6225	0.89	JN
33 5LA7451.0.2	143	4	23	62	41	3917	0.56	JN
11 5LA7285.0.8	146	5	23	63	41	4266	0.61	JN
6 5LA7274.0.6	146	5	23	66	41	4756	0.68	JN
15 5LA7342.0.16	145	5	21	58	35	7274	1.04	JN
23 5LA7357.0.7	137	5	20	52	28	8253	1.18	JN
27 5LA7400.0.23	131	4	26	64	35	7554	1.08	JN
12 5LA7307.0.1	156	6	18	61	33	8393	1.2	JN
28 5LA7400.0.26	154	5	22	60	36	8533	1.22	JN
32 5LA7420.0.2	153	4	20	70	35	7414	1.06	JN
Obsidian Ridge, south Jemez Mountains, NM								
35 5LA7523.0.2	191	1	63	161	86	8043	1.15	JS
1 5LA6125.0.2	207	1	64	170	87	9232	1.32	JS
5 5LA7274.0.5	199	1	63	165	84	9022	1.29	JS
2 5LA6125.0.5	192	6	41	165	47	12100	1.73	JS
20 5LA7351.0.10	173	6	45	167	46	11820	1.69	JS
Wright Creek, near Malad, ID								
17 5LA7342.0.32	119	69	35	87	11	7693	1.1	WC
Presently labeled as Unknown geochemical source								
26 5LA7393.0.3	164	34	26	104	16	9792	1.4	U
25 5LA7391.0.1	165	40	44	289	50	11610	1.66	U
19 5LA7351.0.1	171	6	16	59	34	7623	1.09	U
8 5LA7281.0.7	103	59	29	70	5	10211	1.46	U
16 5LA7342.0.24	124	72	32	81	8	9792	1.4	U

References

- Anderson, D.C., J.A. Tiffany, and F.W. Nelson
1986 Recent Research on Obsidian from Iowa Archaeological Sites, *American Antiquity*, 51(4):837-852.
- Baugh, T.G., and F.W. Nelson
1987 New Mexico Obsidian Sources and Exchange on the Southern Plains, *Journal of Field Archaeology*, 14:313-329.
- Kunselman, Raymond
1994 Prehistoric Obsidian Utilization in the Central Rocky Mountains: The Lookingbill Site 48FR308. *The Wyoming Archaeologist* 34(1-2):15-25.
- Nelson, F.W.
1984 X-ray Fluorescence Analysis of Some Western North American Obsidians, in *Obsidian Studies in the Great Basin*, edited by R.E. Hughes, Contributions of the University of California Archaeological Research Facility, 27-62.
- Stevenson, C.M., and M. Klimkiewicz
1990 X-Ray Fluorescence Analysis of Obsidian Sources in Arizona and New Mexico, *Kiva*, 55:235-243.
- Stevenson, C.M., and M.O. McCurry
1990 Chemical Characterization and Hydration Rate Development for New Mexican Obsidian Sources, *Geoarchaeology*, 5(2):149-170.
- Wolfman, Daniel
1994 *Jemez Mountains Chronology Study*, USDA Forest Service Contract No. 53-8379-9-14). (With contributions by Ray Kunselman on obsidian XRF in Appendix 2.)

Appendix IV: Black Hills Archaeological Sites Inventory – Site Information

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7265	Lithic Scatter	Prehistoric	Stage Canyon	5137	0.994	Not Eligible
5LA7266	Lithic Scatter	Prehistoric	Stage Canyon	5137	0.077	Not Eligible
5LA7267	Lithic Scatter	Prehistoric	Stage Canyon	5140	0.183	Not Eligible
5LA7268	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.411	Eligible
5LA7269	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.737	Not Eligible
5LA7270	Lithic Scatter	Prehistoric	Stage Canyon	5110	0.943	Eligible
5LA7271	Lithic Scatter	Prehistoric	Stage Canyon	5137	0.146	Not Eligible
5LA7272	Lithic Scatter	Prehistoric	Stage Canyon	5180	0.132	Not Eligible
5LA7273	Lithic Scatter	Prehistoric	Stage Canyon	5150	0.183	Not Eligible
5LA7274	Lithic Scatter	Prehistoric	Stage Canyon	5140	0.297	Not Eligible
5LA7275	Lithic Scatter	Prehistoric	Stage Canyon	5175	0.234	Not Eligible
5LA7276	Lithic Scatter	Prehistoric	Stage Canyon	5105	0.049	Not Eligible
5LA7277	Lithic Scatter	Prehistoric	Stage Canyon	5060	1.49	Eligible
5LA7278	Lithic Scatter	Prehistoric	Stage Canyon	5070	0.297	Not Eligible
5LA7279	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.293	Not Eligible
5LA7280	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.543	Not Eligible
5LA7281	Lithic Scatter	Prehistoric	Stage Canyon	5210	0.972	Eligible
5LA7282	Lithic Scatter	Prehistoric	Stage Canyon	5220	3.26	Eligible
5LA7283	Lithic Scatter	Historic/Prehist.	Stage Canyon	5203	1.39	Eligible
5LA7284	Lithic Scatter	Prehistoric	Stage Canyon	5230	2.33	Not Eligible
5LA7285	Lithic Scatter	Prehistoric	Stage Canyon	5120	0.678	Not Eligible
5LA7286	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.45	Not Eligible
5LA7287	Lithic Scatter	Prehistoric	Stage Canyon	5163	0.033	Not Eligible
5LA7288	Lithic Scatter	Prehistoric	Stage Canyon	5185	0.007	Not Eligible
5LA7289	Lithic Scatter	Prehistoric	Stage Canyon	5185	0.161	Not Eligible
5LA7290	Lithic Scatter	Prehistoric	Stage Canyon	5195	0.249	Not Eligible
5LA7291	Lithic Scatter	Prehistoric	Stage Canyon	5195	2.94	Not Eligible
5LA7292	Lithic Scatter	Prehistoric	Stage Canyon	5180	0.532	Not Eligible
5LA7293	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.451	Not Eligible
5LA7294	Lithic Scatter	Prehistoric	Stage Canyon	5170	0.763	Not Eligible
5LA7295	Lithic Scatter	Prehistoric	Stage Canyon	5140	0.833	Not Eligible
5LA7296	Lithic Scatter	Prehistoric	Stage Canyon	5040	0.176	Not Eligible
5LA7297	Lithic Scatter	Prehistoric	Stage Canyon	5020	1.38	Not Eligible
5LA7298	Lithic Scatter	Prehistoric	Stage Canyon	5030	2.38	Not Eligible
5LA7299	Lithic Scatter	Prehistoric	Stage Canyon	5130	0.139	Not Eligible
5LA7300	Lithic Scatter	Prehistoric	Stage Canyon	5125	1.02	Not Eligible
5LA7301	Lithic Scatter	Prehistoric	Stage Canyon	5140	0.928	Not Eligible
5LA7302	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.748	Not Eligible
5LA7303	Lithic Scatter	Prehistoric	Stage Canyon	5100	8.8	Eligible
5LA7304	Lithic Scatter	Prehistoric	Stage Canyon	5210	1.2	Not Eligible
5LA7305	Lithic Scatter	Prehistoric	Stage Canyon	5235	0.763	Not Eligible
5LA7306	Lithic Scatter	Prehistoric	Stage Canyon	5165	0.678	Not Eligible
5LA7307	Structure	Prehistoric	Stage Canyon	5180	5.07	Eligible

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7308	Rockshelter with wall	Prehistoric	Stage Canyon	5080	0.293	Not Eligible
5LA7309	Rockshelter	Historic/Prehist.	Stage Canyon	5160	0.998	Not Eligible
5LA7310	Structure w/rockshlter	Prehistoric	Stage Canyon	5140	11.28	Eligible
5LA7311	Structure	Prehistoric	Stage Canyon	5160	0.906	Eligible
5LA7312	Rockshelter	Prehistoric	Stage Canyon	5160	0.141	Not Eligible
5LA7313	Lithic Scatter	Historic/Prehist.	Stage Canyon	5220	0.234	Not Eligible
5LA7314	Lithic Scatter	Prehistoric	Stage Canyon	5210	0.925	Not Eligible
5LA7315	Lithic Scatter	Prehistoric	Stage Canyon	5165	0.186	Not Eligible
5LA7316	Lithic Scatter	Prehistoric	Stage Canyon	5185	0.931	Not Eligible
5LA7317	Lithic Scatter	Prehistoric	Stage Canyon	5165	0.002	Not Eligible
5LA7318	Lithic Scatter	Prehistoric	Stage Canyon	5190	0.422	Not Eligible
5LA7319	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.128	Not Eligible
5LA7320	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.359	Not Eligible
5LA7321	Lithic Scatter	Prehistoric	Stage Canyon	5321	0.205	Not Eligible
5LA7322	Lithic Scatter	Prehistoric	Stage Canyon	5223	0.039	Not Eligible
5LA7323	Lithic Scatter	Prehistoric	Stage Canyon	5215	1	Not Eligible
5LA7324	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.013	Not Eligible
5LA7325	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.697	Not Eligible
5LA7326	Lithic Scatter	Prehistoric	Stage Canyon	5230	0.326	Not Eligible
5LA7327	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.311	Not Eligible
5LA7328	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.297	Not Eligible
5LA7329	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.506	Not Eligible
5LA7330	Lithic Scatter	Prehistoric	Stage Canyon	5265	0.066	Not Eligible
5LA7331	Lithic Scatter	Prehistoric	Stage Canyon	5180	0.66	Not Eligible
5LA7332	Lithic Scatter	Prehistoric	Stage Canyon	5240	0.179	Not Eligible
5LA7333	Rockshelter with wall	Prehistoric	Stage Canyon	5220	1.33	Eligible
5LA7334	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.249	Not Eligible
5LA7335	Rockshelter	Prehistoric	Stage Canyon	5200	0.238	Not Eligible
5LA7336	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.117	Not Eligible
5LA7337	Lithic Scatter	Prehistoric	Stage Canyon	5225	0.425	Not Eligible
5LA7338	Rockshelter	Prehistoric	Stage Canyon	5165	0.011	Not Eligible
5LA7339	Lithic Scatter	Prehistoric	Stage Canyon	5090	0.719	Not Eligible
5LA7340	Lithic Scatter	Prehistoric	Stage Canyon	5175	0.106	Not Eligible
5LA7341	Lithic Scatter	Prehistoric	Stage Canyon	5025	1.46	Eligible
5LA7342	Lithic Scatter	Prehistoric	Stage Canyon	5100	31.29	Eligible
5LA7343	Lithic Scatter	Prehistoric	Stage Canyon	5240	0.296	Not Eligible
5LA7344	Lithic Scatter	Prehistoric	Stage Canyon	5225	0.513	Not Eligible
5LA7345	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.258	Not Eligible
5LA7346	Lithic Scatter	Prehistoric	Stage Canyon	5225	0.209	Not Eligible
5LA7347	Lithic Scatter	Prehistoric	Stage Canyon	5225	0.521	Not Eligible
5LA7348	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.275	Not Eligible
5LA7349	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.543	Not Eligible
5LA7350	Lithic Scatter	Prehistoric	Stage Canyon	5190	0.367	Not Eligible
5LA7351	Lithic Scatter	Prehistoric	Stage Canyon	5140	2.54	Eligible
5LA7352	Lithic Scatter	Prehistoric	Stage Canyon	5160	0.576	Not Eligible
5LA7353	Lithic Scatter	Prehistoric	Stage Canyon	5160	0.462	Not Eligible
5LA7354	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.004	Not Eligible

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7355	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.049	Not Eligible
5LA7356	Lithic Scatter	Prehistoric	Stage Canyon	5080	0.381	Not Eligible
5LA7357	Lithic Scatter	Prehistoric	Stage Canyon	5150	11.86	Eligible
5LA7358	Lithic Scatter	Prehistoric	Stage Canyon	5120	0.055	Not Eligible
5LA7359	Lithic Scatter	Prehistoric	Stage Canyon	5180	1.62	Not Eligible
5LA7360	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.219	Not Eligible
5LA7361	Lithic Scatter	Prehistoric	Stage Canyon	5160	0.466	Not Eligible
5LA7362	Lithic Scatter	Prehistoric	Stage Canyon	5150	1.03	Not Eligible
5LA7363	Lithic Scatter	Prehistoric	Stage Canyon	5160	0.157	Not Eligible
5LA7364	Lithic Scatter	Prehistoric	Stage Canyon	5175	0.763	Not Eligible
5LA7365	Structure	Prehistoric	Stage Canyon	5170	4.5	Eligible
5LA7381	Lithic Scatter	Prehistoric	Stage Canyon	5170	0.253	Not Eligible
5LA7382	Lithic Scatter	Prehistoric	Stage Canyon	5165	0.042	Not Eligible
5LA7383	Rockshelter	Prehistoric	Stage Canyon	5185	1.39	Eligible
5LA7384	Procurement site	Prehistoric	Stage Canyon	5185	0.499	Not Eligible
5LA7385	Lithic Scatter	Prehistoric	Stage Canyon	5180	0.198	Not Eligible
5LA7386	Lithic Scatter	Prehistoric	Stage Canyon	5160	0.711	Not Eligible
5LA7387	Lithic Scatter	Prehistoric	Stage Canyon	5090	1.27	Not Eligible
5LA7388	Rockshelter	Prehistoric	Stage Canyon	5170	0.433	Not Eligible
5LA7389	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.157	Not Eligible
5LA7390	Lithic Scatter	Prehistoric	Stage Canyon	5180	0.041	Not Eligible
5LA7391	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.48	Not Eligible
5LA7392	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.115	Not Eligible
5LA7393	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.231	Not Eligible
5LA7394	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.017	Not Eligible
5LA7395	Lithic Scatter	Prehistoric	Stage Canyon	5220	0.08	Not Eligible
5LA7396	Lithic Scatter	Prehistoric	Stage Canyon	5400	0.012	Not Eligible
5LA7397	Lithic Scatter	Prehistoric	OV Mesa	5170	0.075	Not Eligible
5LA7398	Rockshelter	Prehistoric	OV Mesa	5160	0.021	Not Eligible
5LA7399	Lithic Scatter	Prehistoric	Stage Canyon	5180	0.007	Not Eligible
5LA7400	Lithic Scatter	Prehistoric	Stage Canyon	5100	39.79	Eligible
5LA7401	Lithic Scatter	Historic/Prehist.	Stage Canyon	5190	0.466	Not Eligible
5LA7402	Lithic Scatter	Historic/Prehist.	Stage Canyon	5220	5.2	Not Eligible
5LA7403	Lithic Scatter	Historic/Prehist.	Stage Canyon	5220	16.38	Eligible
5LA7404	Lithic Scatter	Prehistoric	Stage Canyon	5240	1.14	Not Eligible
5LA7405	Lithic Scatter	Prehistoric	Stage Canyon	5245	0.675	Not Eligible
5LA7406	Lithic Scatter	Prehistoric	Stage Canyon	5230	0.458	Not Eligible
5LA7407	Lithic Scatter	Prehistoric	Stage Canyon	5200	3.78	Not Eligible
5LA7408	Lithic Scatter	Prehistoric	Stage Canyon	5255	0.036	Not Eligible
5LA7409	Lithic Scatter	Prehistoric	Stage Canyon	5210	1.07	Not Eligible
5LA7410	Lithic Scatter	Prehistoric	Stage Canyon	5125	0.253	Eligible
5LA7411	Lithic Scatter	Prehistoric	Stage Canyon	5150	0.488	Not Eligible
5LA7412	Lithic Scatter	Prehistoric	Stage Canyon	5140	0.181	Not Eligible
5LA7413	Lithic Scatter	Prehistoric	Stage Canyon	5200	0.091	Not Eligible
5LA7414	Lithic Scatter	Prehistoric	Stage Canyon	5210	0.036	Not Eligible
5LA7415	Lithic Scatter	Prehistoric	Stage Canyon	5180	0.22	Not Eligible
5LA7416	Lithic Scatter	Prehistoric	Stage Canyon	5125	5.1	Eligible

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7417	Historic debris	Prehistoric	Stage Canyon	5080	0.057	Not Eligible
5LA7418	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.392	Eligible
5LA7419	Lithic Scatter	Prehistoric	Stage Canyon	5140	3.04	Eligible
5LA7420	Lithic Scatter	Prehistoric	Stage Canyon	5120	11.25	Eligible
5LA7421	Structure	Prehistoric	Stage Canyon	5240	0.444	Eligible
5LA7422	Lithic Scatter	Prehistoric	Stage Canyon	5200	1.34	Not Eligible
5LA7423	Rockshelter with wall	Prehistoric	Stage Canyon	5500	0.576	Not Eligible
5LA7424	Procurement site	Prehistoric	Stage Canyon	5225	0.862	Not Eligible
5LA7425	Lithic Scatter	Prehistoric	Stage Canyon	5240	0.297	Not Eligible
5LA7426	Lithic Scatter	Prehistoric	Stage Canyon	5300	0.697	Not Eligible
5LA7427	Lithic Scatter	Prehistoric	Stage Canyon	5000	0.097	Not Eligible
5LA7428	Lithic Scatter	Prehistoric	Stage Canyon	5000	0.271	Not Eligible
5LA7429	Lithic Scatter	Prehistoric	Stage Canyon	5180	4.42	Not Eligible
5LA7430	Lithic Scatter	Prehistoric	Stage Canyon	5010	0.697	Not Eligible
5LA7431	Lithic Scatter	Prehistoric	Stage Canyon	5120	0.183	Not Eligible
5LA7432	Lithic Scatter	Prehistoric	Stage Canyon	5030	0.19	Not Eligible
5LA7433	Lithic Scatter	Prehistoric	Stage Canyon	5110	0.414	Not Eligible
5LA7434	Lithic Scatter	Prehistoric	Stage Canyon	5120	0.286	Not Eligible
5LA7435	Lithic Scatter	Prehistoric	Stage Canyon	5075	0.124	Not Eligible
5LA7436	Lithic Scatter	Prehistoric	Stage Canyon	5040	0.088	Not Eligible
5LA7437	Lithic Scatter	Prehistoric	Stage Canyon	5075	0.234	Not Eligible
5LA7438	Lithic Scatter	Prehistoric	Stage Canyon	5045	0.201	Eligible
5LA7439	Lithic Scatter	Prehistoric	Stage Canyon	5310	0.06	Not Eligible
5LA7440	Lithic Scatter	Prehistoric	Stage Canyon	5290	0.009	Not Eligible
5LA7441	Lithic Scatter	Prehistoric	Stage Canyon	5020	1.78	Not Eligible
5LA7442	Lithic Scatter	Prehistoric	Stage Canyon	5060	0.035	Not Eligible
5LA7443	Rockshelter	Prehistoric	Stage Canyon	5090	2.67	Eligible
5LA7444	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.112	Not Eligible
5LA7445	Lithic Scatter	Prehistoric	Stage Canyon	5010	0.326	Not Eligible
5LA7446	Lithic Scatter	Prehistoric	Stage Canyon	5000	0.121	Not Eligible
5LA7447	Procurement site	Prehistoric	Stage Canyon	5200	0.074	Not Eligible
5LA7448	Rockshelter	Prehistoric	Stage Canyon	5200	0.738	Eligible
5LA7449	Lithic Scatter	Prehistoric	Stage Canyon	5020	0.023	Not Eligible
5LA7450	Lithic Scatter	Prehistoric	Stage Canyon	5040	0.015	Not Eligible
5LA7451	Lithic Scatter	Prehistoric	Stage Canyon	5020	3.139	Not Eligible
5LA7452	Lithic Scatter	Prehistoric	Stage Canyon	5050	4.7	Eligible
5LA7453	Lithic Scatter	Prehistoric	Stage Canyon	5040	1.59	Not Eligible
5LA7454	Lithic Scatter	Prehistoric	Stage Canyon	5040	0.124	Not Eligible
5LA7455	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.014	Not Eligible
5LA7456	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.084	Not Eligible
5LA7457	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.081	Not Eligible
5LA7458	Lithic Scatter	Prehistoric	Stage Canyon	5060	0.123	Not Eligible
5LA7459	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.082	Not Eligible
5LA7460	Lithic Scatter	Prehistoric	Stage Canyon	5060	0.082	Not Eligible
5LA7461	Lithic Scatter	Prehistoric	Stage Canyon	5010	0.634	Not Eligible
5LA7462	Lithic Scatter	Prehistoric	Stage Canyon	5000	0.539	Not Eligible
5LA7463	Structure	Prehistoric	Stage Canyon	5005	1.6	Eligible

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7464	Lithic Scatter	Prehistoric	Stage Canyon	5045	0.009	Not Eligible
5LA7465	Lithic Scatter	Prehistoric	Stage Canyon	5025	0.3	Not Eligible
5LA7466	Structure	Prehistoric	Stage Canyon	5015	1.36	Eligible
5LA7467	Lithic Scatter	Prehistoric	Stage Canyon	5020	0.425	Not Eligible
5LA7468	Lithic Scatter	Prehistoric	Stage Canyon	5010	0.532	Not Eligible
5LA7469	Lithic Scatter	Prehistoric	Stage Canyon	5050	0.322	Not Eligible
5LA7470	Lithic Scatter	Prehistoric	Stage Canyon	5160	0.293	Not Eligible
5LA7471	Lithic Scatter	Prehistoric	Stage Canyon	5225	3.41	Eligible
5LA7472	Lithic Scatter	Prehistoric	Stage Canyon	5240	0.37	Not Eligible
5LA7473	Lithic Scatter	Prehistoric	Stage Canyon	5240	0.303	Not Eligible
5LA7474	Lithic Scatter	Prehistoric	Stage Canyon	5250	0.095	Not Eligible
5LA7475	Lithic Scatter	Prehistoric	Stage Canyon	5265	0.142	Not Eligible
5LA7476	Procurement site	Prehistoric	Stage Canyon	5260	0.242	Not Eligible
5LA7477	Lithic Scatter	Prehistoric	Stage Canyon	5365	0.516	Not Eligible
5LA7478	Lithic Scatter	Prehistoric	Stage Canyon	5280	0.02	Not Eligible
5LA7479	Lithic Scatter	Prehistoric	Stage Canyon	5030	0.612	Not Eligible
5LA7480	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.235	Not Eligible
5LA7487	Lithic Scatter	Prehistoric	Stage Canyon	5080	0.746	Not Eligible
5LA7488	Lithic Scatter	Prehistoric	Stage Canyon	5100	0.107	Not Eligible
5LA7489	Lithic Scatter	Prehistoric	Stage Canyon	5080	0.197	Not Eligible
5LA7490	Lithic Scatter	Prehistoric	Stage Canyon	5030	0.602	Not Eligible
5LA7491	Rockshelter	Prehistoric	Stage Canyon	5000	1.46	Eligible
5LA7492	Lithic Scatter	Prehistoric	Stage Canyon	5030	0.143	Not Eligible
5LA7493	Lithic Scatter	Historic/Prehist.	OV Mesa	5300	0.568	Not Eligible
5LA7494	Lithic Scatter	Prehistoric	OV Mesa	5210	0.466	Not Eligible
5LA7495	Lithic Scatter	Prehistoric	OV Mesa	5200	0.135	Not Eligible
5LA7496	Lithic Scatter	Prehistoric	Stage Canyon	5065	0.238	Not Eligible
5LA7497	Lithic Scatter	Prehistoric	Stage Canyon	5020	0.45	Not Eligible
5LA7498	Lithic Scatter	Prehistoric	Stage Canyon	5060	1.25	Not Eligible
5LA7499	Lithic Scatter	Prehistoric	OV Mesa	5320	0.002	Not Eligible
5LA7500	Lithic Scatter	Prehistoric	OV Mesa	5300	0.249	Not Eligible
5LA7501	Lithic Scatter	Prehistoric	OV Mesa	5290	0.018	Not Eligible
5LA7502	Lithic Scatter	Prehistoric	OV Mesa	5330	0.157	Not Eligible
5LA7503	Lithic Scatter	Prehistoric	OV Mesa	5290	0.631	Not Eligible
5LA7504	Lithic Scatter	Prehistoric	OV Mesa	5200	0.018	Not Eligible
5LA7505	Lithic Scatter	Prehistoric	OV Mesa	5265	0.33	Not Eligible
5LA7506	Lithic Scatter	Prehistoric	OV Mesa	5250	0.003	Not Eligible
5LA7507	Plane Crash	Historic/Prehist.	Stage Canyon	5160	23.06	Not Eligible
5LA7508	Procurement site	Prehistoric	OV Mesa	5290	0.607	Not Eligible
5LA7509	Lithic Scatter	Prehistoric	OV Mesa	5260	1.67	Eligible
5LA7510	Lithic Scatter	Prehistoric	OV Mesa	5325	0.333	Not Eligible
5LA7511	Lithic Scatter	Prehistoric	OV Mesa	5320	0.397	Not Eligible
5LA7512	Lithic Scatter	Prehistoric	OV Mesa	5320	0.119	Not Eligible
5LA7513	Lithic Scatter	Prehistoric	OV Mesa	5320	0.583	Not Eligible
5LA7514	Lithic Scatter	Prehistoric	OV Mesa	5320	0.473	Not Eligible
5LA7515	Lithic Scatter	Prehistoric	OV Mesa	5100	0.242	Not Eligible
5LA7516	Lithic Scatter	Prehistoric	OV Mesa	5292	0.333	Not Eligible

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7517	Lithic Scatter	Prehistoric	OV Mesa	5300	0.216	Not Eligible
5LA7518	Structure	Prehistoric	OV Mesa	5320	0.609	Eligible
5LA7519	Lithic Scatter	Historic/Prehist.	OV Mesa	5340	0.176	Not Eligible
5LA7520	Lithic Scatter	Historic/Prehist.	OV Mesa	5360	1.34	Not Eligible
5LA7521	Lithic Scatter	Historic/Prehist.	OV Mesa	5300	0.311	Not Eligible
5LA7522	Lithic Scatter	Prehistoric	OV Mesa	5300	0.825	Not Eligible
5LA7523	Rockshelter with wall	Prehistoric	OV Mesa	5310	1.59	Eligible
5LA7524	Procurement site	Prehistoric	OV Mesa	5305	0.267	Not Eligible
5LA7525	Procurement site	Prehistoric	OV Mesa	5125	0.055	Not Eligible
5LA7526	Lithic Scatter	Prehistoric	OV Mesa	5280	0.028	Not Eligible
5LA7527	Lithic Scatter	Prehistoric	OV Mesa	5280	0.012	Not Eligible
5LA7528	Historic structure	Historic/Prehist.	OV Mesa	5350	0.052	Not Eligible
5LA7529	Lithic Scatter	Prehistoric	OV Mesa	5350	0.02	Not Eligible
5LA7530	Rockshelter	Prehistoric	OV Mesa	5330	0.939	Not Eligible
5LA7531	Lithic Scatter	Prehistoric	OV Mesa	5360	0.035	Not Eligible
5LA7532	Lithic Scatter	Prehistoric	OV Mesa	5060	0.003	Not Eligible
5LA7533	Lithic Scatter	Prehistoric	OV Mesa	5345	0.183	Not Eligible
5LA7534	Lithic Scatter	Prehistoric	OV Mesa	5330	0.198	Not Eligible
5LA7535	Lithic Scatter	Prehistoric	OV Mesa	5320	0.304	Not Eligible
5LA7536	Lithic Scatter	Prehistoric	OV Mesa	5310	0.187	Not Eligible
5LA7537	Lithic Scatter	Prehistoric	OV Mesa	5317	0.862	Not Eligible
5LA7538	Lithic Scatter	Historic/Prehist.	OV Mesa	5300	15.5	Eligible
5LA7539	Lithic Scatter	Prehistoric	OV Mesa	5090	0.179	Not Eligible
5LA7540	Procurement site	Prehistoric	OV Mesa	5140	0.154	Not Eligible
5LA7541	Lithic Scatter	Prehistoric	OV Mesa	5300	0.298	Not Eligible
5LA7542	Lithic Scatter	Prehistoric	OV Mesa	5320	1.11	Not Eligible
5LA7543	Lithic Scatter	Prehistoric	OV Mesa	5320	0.009	Not Eligible
5LA7544	Lithic Scatter	Prehistoric	OV Mesa	5320	0.369	Not Eligible
5LA7545	Lithic Scatter	Prehistoric	OV Mesa	5320	0.005	Not Eligible
5LA7546	Lithic Scatter	Prehistoric	OV Mesa	5340	0.005	Not Eligible
5LA7547	Lithic Scatter	Prehistoric	OV Mesa	5330	0.95	Not Eligible
5LA7548	Structure	Prehistoric	OV Mesa	5320	21.725	Eligible
5LA7549	Lithic Scatter	Prehistoric	OV Mesa	5340	10.426	Not Eligible
5LA7550	Lithic Scatter	Historic/Prehist.	OV Mesa	5340	6.183	Not Eligible
5LA7551	Lithic Scatter	Prehistoric	OV Mesa	5330	12.414	Not Eligible
5LA7552	Lithic Scatter	Prehistoric	OV Mesa	5300	0.428	Not Eligible
5LA7553	Lithic Scatter	Historic/Prehist.	OV Mesa	5340	10.191	Not Eligible
5LA7554	Lithic Scatter	Prehistoric	OV Mesa	5346	0.376	Not Eligible
5LA7555	Lithic Scatter	Prehistoric	OV Mesa	5360	0.369	Not Eligible
5LA7556	Lithic Scatter	Prehistoric	OV Mesa	5300	0.851	Not Eligible
5LA7557	Lithic Scatter	Prehistoric	OV Mesa	5310	0.007	Not Eligible
5LA7558	Lithic Scatter	Prehistoric	OV Mesa	5345	0.107	Not Eligible
5LA7559	Lithic Scatter	Prehistoric	OV Mesa	5300	0.146	Not Eligible
5LA7560	Lithic Scatter	Prehistoric	OV Mesa	5310	0.217	Not Eligible
5LA7561	Lithic Scatter	Prehistoric	OV Mesa	5363	0.23	Not Eligible
5LA7562	Lithic Scatter	Prehistoric	OV Mesa	5363	0.464	Not Eligible
5LA7563	Lithic Scatter	Prehistoric	OV Mesa	5363	0.66	Not Eligible

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7564	Lithic Scatter	Prehistoric	OV Mesa	5329	0.008	Not Eligible
5LA7565	Lithic Scatter	Prehistoric	OV Mesa	5329	0.102	Not Eligible
5LA7566	Lithic Scatter	Prehistoric	OV Mesa	5320	0.126	Not Eligible
5LA7567	Lithic Scatter	Prehistoric	OV Mesa	5329	0.204	Not Eligible
5LA7568	Lithic Scatter	Prehistoric	OV Mesa	5319	0.479	Not Eligible
5LA7569	Lithic Scatter	Prehistoric	OV Mesa	5310	0.008	Not Eligible
5LA7570	Lithic Scatter	Prehistoric	OV Mesa	5329	0.023	Not Eligible
5LA7571	Lithic Scatter	Prehistoric	OV Mesa	5320	0.599	Not Eligible
5LA7572	Lithic Scatter	Prehistoric	OV Mesa	5320	0.816	Not Eligible
5LA7573	Lithic Scatter	Prehistoric	OV Mesa	5325	0.314	Not Eligible
5LA7574	Historic debris	Historic	OV Mesa	5330	0.099	Not Eligible
5LA7575	Lithic Scatter	Historic/Prehist.	OV Mesa	5320	0.455	Not Eligible
5LA7576	Lithic Scatter	Historic/Prehist.	OV Mesa	5340	0.583	Not Eligible
5LA7577	Lithic Scatter	Prehistoric	OV Mesa	5360	0.121	Not Eligible
5LA7578	Lithic Scatter	Prehistoric	OV Mesa	5324	0.397	Not Eligible
5LA7579	Lithic Scatter	Prehistoric	OV Mesa	5342	1.416	Not Eligible
5LA7580	Lithic Scatter	Prehistoric	OV Mesa	5305	0.066	Not Eligible
5LA7581	Lithic Scatter	Prehistoric	OV Mesa	5360	16.963	Not Eligible
5LA7582	Lithic Scatter	Prehistoric	OV Mesa	5330	0.998	Eligible
5LA7583	Lithic Scatter	Prehistoric	OV Mesa	5324	0.458	Not Eligible
5LA7584	Lithic Scatter	Prehistoric	OV Mesa	5240	0.019	Not Eligible
5LA7585	Lithic Scatter	Prehistoric	OV Mesa	5340	0.242	Not Eligible
5LA7586	Lithic Scatter	Prehistoric	OV Mesa	5363	0.168	Not Eligible
5LA7587	Lithic Scatter	Prehistoric	OV Mesa	5320	0.139	Not Eligible
5LA7588	Lithic Scatter	Prehistoric	OV Mesa	5315	0.187	Not Eligible
5LA7589	Lithic Scatter	Prehistoric	OV Mesa	5360	0.088	Not Eligible
5LA7590	Lithic Scatter	Prehistoric	OV Mesa	5340	0.363	Not Eligible
5LA7591	Lithic Scatter	Prehistoric	OV Mesa	5340	0.084	Not Eligible
5LA7592	Lithic Scatter	Prehistoric	OV Mesa	5342	0.836	Not Eligible
5LA7593	Lithic Scatter	Prehistoric	OV Mesa	5340	0.069	Not Eligible
5LA7594	Lithic Scatter	Prehistoric	OV Mesa	5340	0.088	Not Eligible
5LA7595	Procurement site	Prehistoric	OV Mesa	5340	1.05	Not Eligible
5LA7596	Rockshelter	Prehistoric	OV Mesa	5340	1.9	Not Eligible
5LA7597	Lithic Scatter	Prehistoric	OV Mesa	5343	0.077	Not Eligible
5LA7598	Lithic Scatter	Prehistoric	OV Mesa	5345	0.279	Not Eligible
5LA7599	Lithic Scatter	Prehistoric	OV Mesa	5330	0.429	Not Eligible
5LA7600	Structure	Prehistoric	OV Mesa	5330	2.68	Eligible
5LA7601	Lithic Scatter	Prehistoric	OV Mesa	5325	0.161	Not Eligible
5LA7602	Lithic Scatter	Prehistoric	OV Mesa	5325	0.414	Not Eligible
5LA7603	Lithic Scatter	Prehistoric	OV Mesa	5362	0.84	Not Eligible
5LA7604	Rockshelter	Prehistoric	OV Mesa	5360	3.9	Eligible
5LA7605	Lithic Scatter	Prehistoric	OV Mesa	5365	1.77	Not Eligible
5LA4938	Structure	Prehistoric	Stage Canyon	4990	2.45	Eligible
5LA6107	Structure	Historic/Prehist.	Stage Canyon	5200	16.4	Eligible
5LA6125	Rockshelter	Prehistoric	Stage Canyon	5133	4.97	Not Eligible
5LA6130	Lithic Scatter	Prehistoric	Stage Canyon	4960	0.546	Not Eligible
5LA6878	Structure	Prehistoric	Stage Canyon	5319	20.05	Eligible

Site No.	Site Type	Age	Quadrangle	Elevation (ft)	Acres	Eligibility
5LA7738	Lithic Scatter	Prehistoric	Stage Canyon	5205	0.17	Not Eligible
5LA7739	Lithic Scatter	Prehistoric	OV Mesa	5362	0.139	Not Eligible
5LA7740	Lithic Scatter	Prehistoric	Stage Canyon	4940	0.001	Not Eligible
5LA7741	Rockshelter	Prehistoric	Stage Canyon	4960	0.41	Not Eligible
5LA7742	Rockshelter	Historic/Prehist.	Stage Canyon	4985	14.9	Not Eligible

Appendix V

1998 PINON CANYON MANEUVER SITE INVENTORY PROJECT GROUNDSTONE ANALYSIS KEY

SITE NUMBER: Record LA site number.
FS # Record Field Specimen or Bag Number.
CONTEXT/FEATURE: Record Loci or Feature Number if necessary.

TYPES:

Basin Metate	Mano
Bedrock Metate	Polishing Stone
Celt	Shaft Straightener
Edge Ground Cobble/Mano	Slab Metate
Hammerstone/Mano	Unknown Fragment

MATERIALS:

Basalt	Quartzite
Conglomerate	Sandstone
Diorite	Schist
Granite	Tuff
Quartz	

OVERALL CONDITION:

< 50%
> 50%
Whole

LENGTH:	Measure in mm.
WIDTH:	Measure in mm.
THICKNESS:	Measure in mm.

BURNING:

Yes
No

SURFACE DESIGNATION: Designate letter of each utilized area.

CONDITION (use area only)

< 50%
> 50%
Whole

TECHNOLOGY:

Ground	N/A
Ground/Battered	Pecked
Ground/Pecked	Polished

SHAPE:

Irregular	Round
N/A	Square
Oval	Undetermined
Rectangular	

STRIATIONS:

Circular	Oblique
Longitudinal	Transverse
Multiple	Undetermined
N/A	

USE WEAR:

Heavy
Light
Moderate
N/A

USE WEAR LENGTH:	Record in mm
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USE WEAR WIDTH:	Record in mm
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METATE DEPTH:	Record in mm.
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Appendix VI

1998 PINON CANYON MANEUVER SITE INVENTORY EDGE-GROUND COBBLE/MANO ANALYSIS KEY

SITE NUMBER: Last four digits of site number
FS # Record Field Specimen or Bag Number.
INVENTORY NUMBER: Lab Inventory Number

MATERIALS:

Basalt	Quartzite
Comglomerate	Sandstone
Diorite	Schist
Granite	Tuff
Quartz	

GRAIN:

Fine
Medium
Coarse

SPECIFIC GRAVITY:

High
Low

LENGTH:	Measure in mm.
WIDTH:	Measure in mm.
THICKNESS:	Measure in mm.
WEIGHT:	Measure in 0.1 gr.

VARIETY:

Cobble
Nodule
Chunk/Block
Split Cobble
Tabular Chunk

X -SECTION:

Oval
Triangular
Plano-convex
Round
Biconvex
Flattened
Rhomboid

OUTLINE:

Irregular	Circular
Oval	Subrectangular
Subsquare	Triangular
Trapizoidal	

FACET #:

Number of utilized or modified surfaces

EDGES:

Single
Double
Multiple

BEVELS:

Single
Double
Triple
Four

STRIATIONS:

Oblique	Transverse
Longitudinal	Multiple
Circular	
N/A	

DEGREE:

Angle of striations in degree

USE ANGLE:

Angle of working edge in degree

BATTERING:

Yes
No

ABRASION/MOD:

Yes
No

STAGE:

Early
Middle
Late

USE WEAR:

Abrasion
Polish
Ground
Ground/Polished

SURFACE DESIGNATION: Designate letter of each utilized area.

CONDITION (use area only)

<50%

>50%

Whole

PASSIVE/ACTIVE:

Passive

Active

Can't Tell

EDGE PLAN:

Straight

Concave

Convex

MANO USE:

Yes

No

WELENGTH:

Working edge length to nearest mm

WEWIDTH:

Working edge width to nearest mm